CAUSAL EXPLANATIONS FOR MATHEMATICS PERFORMANCE GIVEN BY LOW SOCIOECONOMIC STATUS AFRICAN AMERICAN MOTHERS AND THEIR CHILDREN

By
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by

Kenneth R. Cyrus

To my grandparents,

Edward and Elizabeth Cyrus,
and
Anderson and Camilla Catchings,

to my parents,

Frank and Ethel Cyrus,

to my daughter,

Yvette Moran Cyrus,

and to the rest of the immediate and extended

Cyrus family

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Abstract of Dissertation Presented to the Graduate School
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The present study examines the attributional beliefs of low SES African American mothers and their 6th, 7th, and 8th grade children for the children's mathematics performance. Using two attribution measures, the rating scale and chip distribution methods, data from mothers and children were examined for (a) attributional agreement about the causes of mathematics performance, (b) mothers' attributions and children's gender, (c) attributional agreement within the family, (d) mothers' and children's attributional predictions, and (e) whether results would vary depending on the method--chip distribution or rating scale--used for data collection.

The results from the rating scale and chip distribution methods revealed similar findings on all hypotheses except for mothers and gender-related attributions. Both

methods showed that mothers and children generally explained mathematics success as a result of effort, with some emphasis on school and home training. For mathematics failure, mothers emphasized lack of effort, whereas children emphasized lack of home training and lack of effort. Both methods showed that mothers and children within the same household were not in agreement about the causes of mathematics performance. The two methods differed on the issue of mothers and gender-related attributions. The chip distribution method showed that mothers believed that boys and girls succeed and fail in mathematics for the same reasons. The rating scale revealed mothers believed boys have more ability in mathematics than girls and girls had to try harder than boys to be successful in mathematics. For failure, mothers did not make distinctions related to gender. Both methods also showed that mothers could not predict the attributions the children would give for the children's mathematics performance and children could not predict the attributions their mothers would give for the children's performance. Therefore, generally, the rating scale and chip distribution methods provided comparable results when examining the attributions of low SES African American mothers and children, with the exception of gender-related attributions.

Attributional beliefs of the African American family and measurement of academic attributions are discussed.

CHAPTER 1

INTRODUCTION

Attributional beliefs are causal explanations individuals hold for their successful or unsuccessful performance at a task. According to attribution theory, these beliefs influence motivation, which in turn influence achievement. Consequently, research on attributions is valuable to the extent that it provides insights into student motivational factors (Graham, 1991; 1994). Attribution theory was first postulated by Weiner (Weiner, 1979; 1985; 1986), who believed that attributions were one of the most important influences on behavior and motivation in achievement settings. The causal attributions individuals make for their performance will influence the individuals' expectations for success on future tasks and their emotional response to the event. Causal attributions most often given by individuals are ability, effort, task difficulty, and luck. Sixty additional attributions have since been documented by other researchers (Hau & Salili, 1993). Attributions can be classified on three attribution dimensions: locus of cause--whether the reason is internal or external to the individual; stability of cause--whether the reason is temporary or permanent; and controllability of cause--whether the reason is under the control of the individual or not.

Although individuals may use several attributions to explain success and failure, causal dimensions help clarify the similarities and differences among the various causal attributions (Weiner, 1985; 1986; Graham, 1991). For example, ability and effort are

similar attributions in that both attributions are internal to the individual. However, ability and effort are different because ability is considered a stable attribution not subject to change, whereas effort is an unstable attribution which may change from occasion to occasion. Ability cannot be controlled by the individual but effort is controllable. Further, task difficulty and luck are both classified in Weiner's (1985) attribution theory as external attributions and, as such, are not under the control of the individual. However, task difficulty and luck differ in that luck is an unstable attribution because it varies from occasion to occasion, while task difficulty for a specific task is considered a stable or permanent attribution.

Statement of the Problem

Causal attributions about school performance as they are held by a family unit and the similarities and differences in attributional beliefs between parents and children have been the focus of past empirical study (Cashmore & Goodnow, 1986; Hess, Chih-Mei, & McDevitt, 1987; Holloway & Hess, 1982; Holloway, Kashiwagi, Hess, & Azuma, 1986; Stevenson & Lee, 1990; Yamauchi, 1989). This research has revolved around five basic issues: parents and children's agreement about attributions for school performance; parent-child attributional agreement within individual families; comparisons of parent-child agreement between cultures; the relation of gender of the child to causal attributions of both parents and children; and children's accuracy in predicting their mother's attributions about children's school performance.

Three basic problems have emerged from this research. First, there has been a lack of consistency in the measurement of attributions across studies. Three methods have been used: a ranking, a chip distribution, and a rating method. The ranking method asks the subject to rank attributions (such as luck, effort, and ability) from most important to least important. The chip method gives the subjects a limited number of chips (or sometimes points -- e.g. Stevenson & Lee, 1990) that they use to designate the importance of attributions. The rating scale method uses a scale that subjects use to indicate the strength of each attribution. For example, Cashmore and Goodnow (1986) employed a rank order measure when comparing Australian mothers' and children's attributional beliefs. Holloway and Hess (1982) used a chip distribution measure to study Caucasian American mothers and children while Parsons, Adler, and Kaczala (1982) used a rating scale instrument with this population. A point distribution measure was used by Stevenson and Lee (1990) to compare the attributional beliefs of Caucasian American, Chinese, and Japanese mothers and children.

Studies of attributions have used one of these three methods, but not two or three methods at the same time. Inconsistent findings in this area of attribution research may have been caused by the way attributions were measured. Various measurement techniques used in attribution studies have both advantages and disadvantages and different results found in attribution research may vary according to the measurement technique used. This raises questions of reliability and validity for attribution research (Elig & Frieze 1979; Hau & Salili, 1993). The inconsistent use of methods and

subsequent results found in attribution research make predictability and generalization of findings to other populations or situations difficult.

A second problem has been that results across various studies addressing parents' and children's attributions for academic performance were inconclusive. For example, for parents' and children's attributional agreement, Caucasian American mothers and children were in agreement about the causes for academic success and failure (Parsons, Adler, & Kaczala, 1982); however, Holloway and Hess (1982) reported Caucasian American mothers and children were not in agreement about the causes of school performance. In another example, relating to gender, Japanese, Anglo-Australian, and Italian Australian mothers did not make the distinction in attributions between their sons and daughters for their mathematics performance (Cashmore & Goodnow, 1986; Holloway, Kashiwagi, Hess, & Azuma, 1986). In contrast, Parsons, Adler, and Kaczala (1982), Holloway and Hess (1982), and Holloway, Kashiwagi, Hess, and Azuma (1986) found that Caucasian American mothers did make the distinction between attributions for their sons' and daughters' mathematics performance.

The third problem found in the attribution literature has been that research involving African Americans parents and children was quite limited. Some research has been done with African American children that compares them to Caucasian American children (Graham, 1991, 1994). However, no research with African American mothers and children has been done (Graham, 1991; 1994). In reviews of minority participation and achievement in mathematics, Matthews (1984), Reyes and Stanic (1988) identified mothers as an important variable for their children's successful mathematics achievement.

They reported mothers' race, education, attitudes, expectations, and aspirations influenced their children's mathematics achievement. However, both reviews cited a lack of research in this area and recommended more research with minority populations. Although there are few empirical studies, some early research involving minority women scientists (Hall 1981; Kenschaft, 1981; Malcolm, Hall, & Brown, 1976) found that the mother's attitudes about, and a positive belief in their children's ability to achieve success in mathematics, positively influenced the children's participation and performance. More research on motivation is also needed because the African American population has consistently achieved at lower levels than other groups (Jenkins, 1989), particularly in mathematics and especially for the low socioeconomic status (SES) African American population (Reyes, 1984; Reyes & Stanic, 1985; 1988). Therefore, an understanding of the attributional beliefs of low SES African American mothers and children in relation to the children's mathematics performance would seem to be important to understanding their mathematics achievement.

This study examined the causal attributions of low SES African American mothers and children for success and failure in mathematics. The following issues were examined: (a) mothers and children's attributional beliefs about mathematics performance; (b) agreement within the family about that performance; (c) gender differences; (d) the ability of children to predict attributions given by their mothers; and (e) the ability of mothers to predict the attributions given by their children. Additionally, because the research in this field has used both a rating system and a chip distribution

system, both systems will be used to assess these beliefs and to examine the comparability of these methods.

Purpose of the Study

The primary purpose of this study was to compare the causal attributions of low SES African American mothers and children for mathematics performance. The secondary purpose was to compare two attribution instruments in their ability to measure the attributions of low SES African American mothers and children.

The research questions addressed by this study were as follows:

1. Are there significant differences in causal attributions of low SES African American mothers and their children for mathematics success and failure?

2. Do low SES African American mothers give different explanations for mathematics success and failure for their sons and daughters?

3. Can low SES African American mothers predict their children's causal attributions for mathematics success and failure?

4. Can low SES African American children predict their mother's causal attributions for the children's mathematics success and failure?

5. Are there significant differences in causal attributions of low SES African American mothers and their children for mathematics success and failure within the family unit?

6. Will low SES African American mothers' and children's causal attributions differ when measured by separate attribution instruments?

Significance of the Study

Examining the causal attributions of African American children and parents is important for several reasons. First, achievement in school is important. However, African American children have not done well in mathematics, even though their mothers believe they are doing well and will continue to do well (Alexander & Enwistle, 1988; Matthews, 1984; Reyes & Stanic, 1988). Next, achievement is related to motivation and motivation is related to attributions (Weiner, 1986). This connection between attributions and motivation can be seen in other cultures. For example, Japanese and Chinese mothers' belief in hard work or high effort has shown to be highly motivating for their children's mathematics achievement (Holloway, Kashiwagi, Hess, & Azuma, 1986; Stevenson & Lee, 1990). Parents influence the attitudes of children. Interviews of African American parents find they want their children to do well in school (Alexander & Enwistle, 1988; Stevenson, Chin, & Uttal, 1990). Do the attributions held by African American children about motivation correlate to those attributions held by their parents, or are there differences in attributions between mothers and children?

Additionally, this research is important because it attempts to clarify some measurement concerns found in the parents and children's attribution literature. The past research has used numerous methods to measure causal attributions. This may be the cause of some of the inconsistent findings. The present study was designed to determine whether results would be consistent when different methods are used to collect the attribution data. Therefore, this study will determine whether two widely used measurement instruments in attribution research are comparable for assessing the causal

attributions of low SES African American mothers and children for the children's mathematics performance.

This study also provides further testing of attribution theory. Understanding the attributional beliefs of African Americans may assist in understanding the nature of the beliefs that help create the academic conditions experienced by this population. Attribution theory could provide a model to investigate attribution patterns that hinder achievement motivation in mathematics (Graham, 1991; 1994).

Finally this study will assist in establishing future research directions for the study of motivation in the African American family. Graham (1994) has argued for more research involving African American parents and children. She states,

> Future studies conducted within a motivational framework should systematically examine the sources of African-American parents' beliefs about their children's ability and prospects, whether and how these beliefs get communicated to the child, and how they get played out in parenting practices that have the potential to either undermine or enhance achievement strivings. (p. 107)

CHAPTER 2

REVIEW OF THE LITERATURE

The primary purpose of this study was to compare the causal attributions of low SES African American mothers and their children for mathematics performance. A second purpose was to examine whether the rating scale instrument and the chip distribution instrument yield similar and consistent results when measuring mathematics attributions of African American mothers and children.

While mothers' and children's academic attributional beliefs of numerous cultures have been studied (e.g., Bar-Tal & Guttmann, 1981; Cashmore & Goodnow, 1986; Hess, Chih-Mei, & McDevitt, 1987; Holloway, & Hess, 1982; Stevenson & Lee, 1990), African American mothers and children have not been the focus of any studies in the attribution literature. Related literature was therefore chosen for review. The review will be discussed as follows: first, a general overview of Weiner's attribution theory; second, attribution measurement issues; third, attribution patterns of mothers and their children for school performance; fourth, mothers' attributions and gender differences; fifth, children's accuracy in predicting parent's causal attributions for the children's mathematics performance. The chapter concludes with a summary of the review.

Weiner's Attribution Theory

"Attribution theory is a theory of motivation and emotion, with achievement strivings as the theoretical focus" (Weiner, 1985, p. 549). The attribution approach to achievement motivation was originated by Heider (1958) and later elaborated by Weiner (Weiner, 1979; 1986; Weiner & Kukla, 1970). "A central assumption of attribution theory is that the search for understanding is the basic spring to action" (Weiner, 1979, p. 3). In a school setting the search for understanding of success and failure experiences often leads to attributional questions such as "Why did I succeed?" or "Why did I fail?" According to Weiner (1985), the individual's desire for mastery of his or her environment and situations that are unexpected are contributors to searching for causal explanations.

Perceived Causality

In their initial statement regarding the perceived causes of success and failure Weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum (1971) argued that in achievement related contexts the causes perceived as most responsible for success and failure are ability, effort, task difficulty, and luck. They asked participants to rate the importance of four causes of success and failure. The participants were to rate the relative contribution of high or low ability, high or low effort, ease or difficulty of the task, and good or bad luck to account for their success or failure on a task (see also, Weiner, 1986). However, in later studies (Weiner, 1974; Weiner, Russell, & Lerman, 1978) suggested other factors such as mood, fatigue, illness, and bias could serve as necessary and sufficient reasons for achievement performance. Many investigations have been conducted that more systematically examine causal perceptions, particularly the perceived causes of success

and failure (Weiner, 1985). Two research procedures were followed to determine if subjects attributed success and failure to other factors. First, the free response method, in which subjects were provided with only outcome information, namely a success or failure, has taken place. Participants were asked to list all possibilities that come to mind for the success or failure. In the second procedure, subjects were given large lists of causes and were asked to rate the contribution of each cause to the hypothesized outcome (Weiner, 1985, 1986). From these two procedures, a variety of causes have been documented (Weiner, 1986). Among the numerous causes, seven attributions received the most attention including ability, immediate and long-term effort, task characteristics, intrinsic motivation, teacher's competence, mood, and luck. It should be noted that the most dominant causes were ability and effort. In most cases success was attributed to high ability and hard work and failure was thought to be caused by low ability and poor effort (Weiner, 1979; 1985; 1986). This also holds true for a number of cultural groups (Triandis, 1972).

Structure of Perceived Causality

Weiner's (1979; 1985) theory classifies the types of attributions made by individuals by using a three-dimensional taxonomy of causes of success and failure. The first dimension, labeled locus of causality, determines whether a cause is within the person or within the environment. Rotter's (1966) construct of locus of control was the first to classify people as internals or externals. Ability and effort causal attributions are internal to an individual, whereas task difficulty or luck are external.

The second dimension of causality, referred to as stability, characterizes causes on a continuum. Causal attributions can be stable, or invariant, and unstable, or variant. Weiner (1979; 1985) proposes that ability and task difficulty are likely to be perceived as fixed, whereas luck and effort are more variable or unstable.

The third dimension in Weiner's three dimensional taxonomy is labeled controllability. Effort is classified as controllable, while luck, ability, and task difficulty are classified as uncontrollable.

Numerous investigations have provided support for Weiner's taxonomy (Meyer, 1980; Meyer & Koelbl, 1982; Passer, 1977; Stern, 1983; Wimer & Kelly, 1982). Meyer (1980) presented questionnaires with 16 different situations and asked subjects to indicate in each situation how much each of nine attributions was responsible for the outcome. Using factor analysis, the results showed a correspondence between the three dimensions of locus, stability, and controllability. Causal attributions theoretically can be classified within one of eight cells: 2 levels of locus x 2 levels of stability x 2 levels of control (Weiner, 1979).

According to Weiner's theory, each causal dimension has psychological implications for thought and action. The locus of causality dimension has implications for self-esteem. Self-esteem is higher when success is caused by internal factors (effort, and ability) rather than external factors (luck or task difficulty). Self-esteem is lowered when failure is caused by internal factors rather than external factors.

The causal dimension of stability is linked to expectancy for future success. Failure that is caused by low ability or difficultly of task decreases the expectation of

future success more than failure attributed to bad luck, bad mood, and lack of effort (Weiner, 1979). Weiner, Nirenburg, and Goldstein (1976) showed that American college students who were successful at completing block designs because of ability and ease of task anticipated a successful performance in the future, compared to students who were successful because of effort and luck.

The dimension of control is linked to personal responsibility. The dimension of control focuses on inferences about others and how beliefs about another's responsibility for success and failure influence an individual's reactions toward that person. When a person fails for controllable reasons, that person is blamed by others. Therefore, when a person fails for uncontrollable reasons, that person does not receive blame.

Attributions, Expectations, and Consequences

Within Weiner's three-dimensional model, the stability dimension is posited to be related to goal expectancy. According to Weiner (1985, p. 556), "the attributional position is that the stability of a cause rather than its locus, determines expectancy shifts." Therefore, when attributions are classified on the stability dimension they have a link to expectations for future success. For example, if a subject attributed success on an important examination to high ability, expectancy of future success will be high because ability is a stable attribution which in most cases does not change from task to task. But, if the reason for success was attributed to high effort one will not maintain such high expectations for future success because effort may fluctuate from one task to the next. Conversely, for the failure situation, if the cause for failure is one's low ability, the expectancy of success might be decreased because one cannot change ability; but if

failure was attributed to inadequate effort, the positive expectancy for success might stay high because the subject believes that trying hard will bring future success. Thus, if failure is perceived as being caused by lack of effort rather than low ability, expectations of future success will continue to stay high. Although ability and effort are both internal attributions on the locus dimension (Weiner, 1985), ability and effort are classified differently on the stability dimension. This means ability is a stable cause for success and failure, while effort is perceived as unstable in most situations involving failure. Effort is perceived as relatively stable in most situations of success. The attributions of effort may bring about positive expectations in the future with both success and failure, whereas ability attributions will create high expectations of failure.

Attributional theory, therefore,

> is a theory of motivation and emotion in which causal attributions play a key role. The perceived causes of success and failure share three common properties: locus, stability, and controllability. The perceived stability of causes influences changes in expectancy of success. All three dimensions of causality affect a variety of common emotional experiences including anger, gratitude, guilt, hopelessness, pity, pride, and shame. Expectancy and affect, in turn, are presumed to guide motivated behavior. (Weiner, 1985, p. 548)

Attribution Measurement Issues

One of the problems in attribution research has been the lack of consistency in the methods used to measure attributions (Elig & Frieze, 1979; Hau & Salili, 1993; Maruyama, 1982; Whitley & Frieze, 1985). In a thorough review examining the measurement of achievement attributions, Hau and Salili (1993) investigating methods,

question contents, and measurement formats. They concluded that no one method is superior to another. They found that the appropriate use of any attribution measure requires that the instrument specifically match the research question; yet they are not clear on how this should be accomplished. Despite the authors' statement that the method and the research question need to be matched, their review indicates that no one method is superior to another. While the rating scale was the most popular structured method used by attribution researchers, the authors found that all measurement methods are equally satisfactory when used properly. However, they did not answer the question as to whether all measurement instruments would be equally valid for the same research question. Elig and Frieze (1979) also cautioned that various measurement instruments can yield different results for the same research question.

Researchers who have been interested in study of parents' and children's causal attributions for school performance have commonly used three structured measurement techniques. The first type of measure is the chip distribution measure in which parents and children have a limited number of plastic chips that they place on different choices weighting the importance of causal attributions (Dunton, McDevitt & Hess, 1986; Hess, Chih-Mei & McDevitt, 1987; Hess, Holloway & King, 1981; Hess & McDevitt, 1985; Hess, McDevitt & Cheng, 1984; Holloway & Hess 1982; 1984; Holloway, Hess & King, 1981; King, Hess & Holloway, 1981). For example, a child would be asked to place 10 chips on 5 choices according to the importance of each attribution for that child. If 8 chips were placed on the ability attribution option only two chips would be left to place

on the remaining attribution options. A variation of this method uses a limited number of points to indicate the importance of each attribution (Stevenson & Lee, 1990).

A second measurement instrument of parents' and children's attributions for school success and failure is the structured rating scale format. Parents and children rate on Likert-type scales (frequently 5-, 7-, or 9-point) the importance of each attribution (Bar-Tal & Guttmann, 1981; Bird & Berman, 1985; Parsons, Adler & Kaczala, 1982; Yamauchi, 1989; Yee, 1984; Yee & Eccles, 1988). The rating scale method allows participants a chance to rate the importance of each attribution without one rating effecting other ratings.

A third type of measure is the rank order format in which parents and children rank the order of importance of each attribution in relation to other attributions (Cashmore, 1980; 1982; Cashmore & Goodnow, 1986; Holloway, 1986). The rank order method usually has a limited number of attributions and participants must decide which attribution is first, second, or third (or so on) in its contribution for determining success or failure.

It has been recommended (Hau & Salili, 1993) that there should be a match between the research question and the measurement instrument. Attribution researchers who study parents' and children's beliefs about school performance have continued to use a variety of measures to investigate the same research question: "Do parents and children in families hold similar beliefs about the children's success and failure in school?"

The results of this line of research have been inconsistent. Holloway and Hess (1982), using a chip distribution method, found that mothers and their children did not

hold similar beliefs about the causes of children's academic success and failure. However, Parsons, Adler, and Kaczala (1982), using a rating scale, found that parents and children held similar beliefs about causes the children's academic performances. Further, Cashmore and Goodnow (1986), using rank order method, did not find agreement between parents and children. It is unknown as to whether these inconsistent findings were due to the participants in these studies or to the variation in measurement techniques. It is also unclear as to whether the researchers attempted to match the measurement instrumentation with the research question. One weakness in this literature is that no studies were found that simultaneously used two or more methods (chip, rating, or ranking) in order to show the comparability of those measurement instruments.

Attributional Patterns of Mothers and Their Children

Because it is generally believed that parents transmit values, beliefs, or traits to the next generation, one might expect to find agreement about these values, beliefs, or traits between parents and their children (see Cashmore & Goodnow, 1986; Holloway & Hess, 1982). Some attribution researchers examined the possibility that parents convey attributional beliefs regarding academic success and failure directly to their children. However, findings were inconsistent across studies.

Disagreement. In her study investigating parental belief systems about their children's school performance, Cashmore (1980) found little agreement between parents' and children's attributions of 100 Australian children and their parents. Parents and children were asked to rank order three attributions: ability, effort, and teaching. Parents viewed ability as the most important cause of success and effort the most important cause

of failure. Children believed that effort was the most important cause for success while ability was given as the cause for failure. The quality of teaching at school did not seem to be important for either parents or children.

In a follow-up study, Cashmore and Goodnow (1986) compared attributions of mothers, fathers, and their children from an Anglo Saxon Australian sample and an Italian Australian sample. They were asked to put in rank order the attributions of talent, effort, and teaching for six skill areas. Results indicated parents and children's responses varied across these skill areas. Children from both samples cited effort as the most important cause for school performance, while parents in both samples cited talent (ability).

Holloway and Hess (1982) investigated the causal attributions given by mothers for their upper elementary school children to explain their reasons for high and low academic performance. Participants were given chips to place on cards listing attributions in order to weight the importance of ability, effort, personality, and training. Mothers' cited children's ability as the main cause of success, while lack of effort was viewed as the main reason for failure. Children held the opposite belief, that effort was more important for success while lack of ability contributed to failure.

Bar-Tal and Guttmann (1981) compared teachers', students,' and parents' attributions for the students' academic performance. Using a rating scale subjects were asked to rate 10 causes: ability, interest, difficulty of material, effort, teacher's explanation, home conditions, parent's help, luck, diligence, and test difficulty. Findings indicated that parents attributed their children's success to home conditions, and teacher's

explanations. Failure was attributed to bad home conditions and children's low level of interest and ability. Children attributed success to their own effort and teacher's explanation and failure to lack of effort and low ability.

While it was thought by researchers that parents and children might be in agreement, indicating the conveyance of values and beliefs, these studies show a lack of agreement in the attributional beliefs of parents and children about academic performance.

Agreement. In contrast to these findings, some researchers did find agreement between parents and children regarding the attributional beliefs for academic success and failure.

In a study done by Parsons, Adler, and Kaczala (1982), agreement between parents and children in their causal attributions was documented. Using a rating scale measuring attitudes and beliefs about mathematics achievement, children's attributions matched those of their parents. The authors of this study concluded that children's attributions were influenced more by their parents' beliefs about their abilities than by their own previous mathematics achievement history.

Yamauchi (1989) conducted a study that compared the attributions of children with mothers' attributions, and children's predictions of their mothers' attributions for their child's mathematics performances in Japan. The results, from a rating scale procedure, showed that more than half of the children and their mothers attributed school performance to the effort attribution on both success and failure outcomes.

Numerous conclusions can be drawn from these studies. First, it is not clear from the findings of studies in this literature if parents and children hold similar beliefs or attributions within the same culture or vary across different cultures. Second, this literature does not inform us on the best method to measure parents' and children's attributions about school performance. No study explained why a method was chosen to investigate the research question. Finally, this literature provides little guidance as to why these findings have been so inconsistent.

Cultural Patterns.

When parents and children from different countries were compared to examine their attributional beliefs about school performance, findings were different.

Stevenson (1983) conducted a study of parents and children in Japan, Taiwan, and the United States. Participants were first asked to rank four attributions: effort, natural ability, difficulty of school work, and luck regarding the children's achievement. Next, they were asked to divide up 10 points across the 4 attributions. In all three cultures the rank order of importance was the same: effort first, followed by ability, task difficulty, and luck. However, the point distribution method (a variation of the chip distribution method) indicated more emphasis on effort for the Asian populations (Taiwan and Japan) than for the participants from the United States. This study provides some evidence that attributional beliefs may have cultural variations.

In a comparison of Japanese mothers' and children's with American mother's and children's attributions, Hess et al. (1986) found there was a contrast between the two cultures. Using the chip distribution method (see Holloway and Hess, 1982), Japanese

mothers and children weighted lack of effort as the most important cause for mathematics failure, while American mothers' and children's explanations were evenly divided among ability, effort and training at school. Japanese mothers were less likely to blame training at school as a cause of their children's low achievement.

In a further study of Japanese mothers and children who were compared to American mothers and children for causal attributions about mathematics performance cultural differences in attributions, transmission of beliefs from mothers to their children, and the effect of gender of child on attributions were examined by Holloway, Kashiwagi, Hess, and Azuma (1986). Using the chip distribution method, this study also found that there were cultural differences between American and Japanese mothers and their children. Japanese mothers and children tended to stress effort as a cause for success and failure in mathematics, while American mothers and children tended to stress ability.

Similar results were reported by Stevenson, Lee, and Stigler (1986) when comparing Chinese, Japanese and American mothers on beliefs about causes of their children's mathematics success and failure. Using a point distribution system, findings showed that while American mothers gave the largest number of points to ability for explaining why their children succeed or fail in mathematics, the Asian mothers gave the most points to effort.

In another study to investigate cultural variations in family beliefs, Hess, Chih-Mei, and McDevitt (1987) examined beliefs about children's performance in mathematics through interviews with mothers and their 6th grade children involving three cultures, the Peoples' Republic of China, Chinese American, and American. The three groups showed

different attribution patterns with a chip distribution method for the attributions of ability, effort, school training, home training, and luck. Mothers in the Peoples' Republic of China viewed lack of effort as a major cause of low performance. The Chinese American mothers also viewed lack of effort as important concerning failure, but assigned responsibility to other sources. The American mothers distributed responsibility more evenly across the attribution options. Children in the three cultural groups had patterns of attributions similar to those of their parents.

Stevenson and Lee (1990) studied mothers from Japan, Taiwan, and the United States. Participants were asked to rate the influences of the factors of studying hard, intelligence, study habits, a good teacher, home environment, parents' assistance, the curriculum, and luck on academic achievement. American mothers gave higher ratings to study habits, good teacher, home environment, and curriculum than they did to effort. On the other hand, Asian mothers rated effort highly and the only factor they rated higher than effort was good teachers.

These studies provide support for differences in attributions made by Asian parents and children and those made by American parents and children for the children's academic performance. These studies show that Asian parents and children tend to emphasize the effort attribution more strongly than American parents and children. These studies may also lend support for the differences of meaning of effort and ability in the two cultures. A limitation of these studies is that they do not address non-Asian cultures or sub-cultures within the United States. Different attributions could be held by

South American parents and children or Hispanic or African American parents and children.

Summary

In summary, several conclusions can be drawn from the parents' and children's attribution literature regarding academic performance. First, several measurement techniques have been used by researchers in studies that make-up this literature. The methods used were primarily structured interviews. When rating causes, participants were asked to rate on a 5- or 7-point scale. When weighting causes, subjects were asked to place 10 chips or assign 10 or sometimes 100 points to 4 or 5 attributional cards. A few studies asked subjects to rank order attributions. Both rating scale and chip distribution methods were chosen for this study.

Second, researchers have examined and compared attributions of students, teachers, parents, and numerous cultural groups. African American mothers and children are considered to be a sub-culture in the United States. Additionally, they are a population that had not been studied.

Third, a wide variety of attributions have been included in instruments. However, all of the instrument included ability and effort. The instruments chosen therefore needed to include these attributional elements.

Finally, it may be difficult to generalize from findings in this literature to other groups because findings have not always been consistent. It was hoped that this study would address this issue.

Mothers' Attributions and Gender Differences

Examining gender differences in mother attributions is important for two reasons. Boys and girls have long been shown to have different attitudes and different performance levels in mathematics (Fox, Tobin, & Brody, 1979; Holloway & Hess, 1984; Reyes & Stanic, 1988).

Cashmore (1980) examined the causal attributions of 100 Australian mothers and children across 6 achievement areas. Subjects were asked to rank order the attributions of talent, effort, and teaching. Parents did not rate boys and girls differently. The findings found no differences.

Bar-Tal and Guttmann (1981) examined the causal attributions for mathematics performance of boys and girls by Israeli parents, teachers and students. Participants were asked to rate 10 attributions for their contribution to mathematics success and failure. Results indicated that fathers and mothers believed boys and girls succeed in mathematics because of home conditions and teacher's explanations while they both fail because of bad home conditions, low interest, and low ability. The author's concluded there were no gender differences.

Hess, Holloway, and King (1981), Holloway, Hess and King (1981), and King, Hess, and Holloway (1981) compared the causal attributions for 21 mothers and their 5th and 6th grade children. Participants were given open-ended questionnaires to ascertain the children's spontaneous attributions about doing well or poorly in school. Participants were then asked to place 10 chips on 5 attributional cards. The attributions were ability, effort, personality and good teaching. Results showed that mothers attributed both sons'

and daughters' academic successes to ability. Moreover, mothers thought that lack of effort was a more important explanation for poor performance than lack of talent, regardless of gender.

Holloway (1986) conducted a study of children's achievement in mathematics and their motivation to achieve in mathematics. Holloway, found that mothers of girls made more attributions to ability and task difficulty for success and were more satisfied with past performance than were mothers of boys, but exerted less academic achievement pressure. Mothers of boys were found to make more attributions to effort and luck for the success of their sons than mothers of girls. However, mothers exerted more academic pressure on their sons to achieve. These differences were, however, minor and the author concluded that there were few differences overall.

In contrast to the studies showing no differences, there is research that indicates that mothers do hold gender related beliefs about their children's school performance.

In a study by Holloway and Hess (1982), 21 mothers and children in 5th and 6th grade were asked to place 10 chips on 5 attributional cards for success and failure in a subject of high achievement and for failure in a subject of low achievement. Findings indicated that mother of boys believed boys had more ability than girls while girls had to exert more effort to be successful in school.

Parsons, Adler, and Kaczala (1982) compared the causal attributions for mathematics performance of 5th through 11th grade students and their parents. Participants were asked to rate on 7-point Likert scales their attitudes and beliefs about mathematics performance. Results showed that parents held sex-differentiated

perception's of their children's mathematics aptitude despite the similarity of performance of boys and girls. Parents of girls thought their daughters had to work harder to do well in mathematics than did parents of sons. Parents of boys believed advanced mathematics was more important for their sons when compared to their daughters.

In a study of Holloway and Hess (1984) investigating gender differences in teacher and in parental beliefs, no significant sex differences on an achievement assessment for mathematics performance were found for boys' and girls' mathematics performance in 6th grade.

In a study by Yee and Eccles (1988), 7th grade students and parents were asked to complete questionnaires at home about beliefs, expectations, and causal attributions for their children's mathematics achievement. The results indicated that parents' perceptions and expectations were commensurate with their child's level of mathematics ability. Mothers attributions for mathematics successes differed for boys and girls.

Dunton, McDevitt, and Hess (1988) conducted a longitudinal study investigating the origins of mothers' attributions about their daughters' and sons' academic performance at 5 and 6 years of age and again at age 12. The findings indicated that there are both similarities and differences in the sources of attributions given by mothers for their children's performance. Mothers of boys attributed the source of their attributions to their son's prior performance.

Mothers of son's attributed relative success to having ability and the relative failure to lack of effort. The source of the mother's attributions for their daughters was the affective relationship they have with them. Mothers of girls attributed their daughters'

relative success or failure to ability or effort depending on the type of affective relationship.

Several conclusions can be drawn from the attribution literature related to mother's attributions and gender differences. Evidence supporting mothers' contributions to gender related attributions is mixed. Some studies show that mothers do not hold gender related differences for their children's school performance, particularly mathematics. Additionally, researchers have used several methods and cultural groups when examining mothers' attributions and gender differences. There were no studies that examined African American mothers and their gender related attributions. Finally, generalizing findings from this literature to other cultural groups is difficult because the findings are inconsistent.

Children's Prediction of Their Mother's Causal Attributions

Parental accuracy in predicting their children's causal attributions for success and failure at school has not received much research attention. Yamauchi (1989) asked Japanese children to predict their mother's attributions for the child's mathematics performance. Using a rating scale methodology, results showed a discrepancy between children's predictions of mothers' attributions and mothers actual attributions which varied by children's school performance. The researcher concluded that children's predictions of their mothers' mathematics attributions were not related to their mother's actual attributions. Further research was recommended. As mothers' predictions of their children's attributions about mathematics performance were not investigated, they might yield more insight into this area.

Summary

While mothers' and children's attributional beliefs regarding mathematics performance in numerous cultures have been studied, the attributional beliefs of African American mothers and their children for the children's mathematics performance has been neglected in the attribution literature. The primary purpose of this study was to compare the causal attributions of low SES African American mothers and their children for mathematics performance; a second purpose was to examine whether the rating scale instrument and the chip distribution instrument yield similar and consistent results when measuring mathematics attributions of African American mothers and children.

The review examined Weiner's attribution theory, attribution measurement issues, attribution patterns of mothers and their children for school performance, mothers' attributions and gender differences, and children's accuracy in predicting parent's causal attributions for the children's mathematics performance.

Weiner's attribution theory can be used to study achievement motivation. Attributions, or the reasons given by an individual to explain success and failure, are dimensionalized in relationship to the individual (e.g. internal/external; controllable/uncontrollable; stable/unstable) and provide meaning that has expectations and consequences for that person. Numerous achievement attributions have been documented in the literature, but most prominent among them are ability, and effort, usually in conjunction with additional attributions.

An examination of the literature indicated that a variety of attribution measurement instruments have been employed by researchers. Common among them are

weighting instruments, rating scales, and rankings. The findings from studies have frequently been compared to other studies without regard for the measurement instrument used. This indicated a need for some studies that simultaneously used two or more methods to see if the different instruments did, in fact, produce comparable results.

Studies of attribution patterns of mothers and their children for school performance were examined to see if attributions were transmitted within the family. While numerous studies using a variety of methods and looking at several cultures examined this issue, the results were inconclusive. Ability and effort are often cited as reasons for both success and failure, but mothers and children did not always give the attributions the same importance.

Because gender differences have been found to exist in children's mathematics performances, the literature regarding mothers' attributions and gender differences was examined. Again, using a variety of methods and cultures the results were not consistent.

Children's accuracy in predicting parent's causal attributions for the children's mathematics performance was examined. This was seen as an additional way it might be determined that beliefs about academic achievement, especially for mathematics, were transmitted. Further research was found to be needed in this area. In conclusion, the lack of consistency found in the attribution literature supports the need for additional studies, especially with a population that has received little attention, African American mothers and their children, and to utilize two instruments to determine their comparability. It was to this end that this study was undertaken.

CHAPTER 3

METHODOLOGY

In this study the causal attributions made by low SES African American mothers and their children for the children's mathematics success and failure were compared. In addition, two attribution instruments for measuring mothers' and children's causal attributions were compared.

While a variety of methods and populations have been used in studies of parents and children's attributions for the children's school performance, low SES African American mothers and children have not been the focus of this research. Attribution research with low SES African American mothers and children appears warranted, especially in the area of mathematics, where low SES African American children achieve poorly, and are under represented in mathematics courses in high school and in mathematics related careers (Matthews, 1984; Reyes & Stanic, 1985, 1988).

Hypotheses

The causal attributions of African American mothers for their children's school performance were compared to the causal attributions of their 6th, 7th, or 8th grade African American children. Based on the parents' and children's attribution literature

involving school performance, the following hypotheses were expected to be supported by this study:

1. Low SES African American mothers will not agree with their children about causal attributions for mathematics success and failure.

2. Low SES African American mothers will not make different attributions for boys and girls about their mathematics success and failure.

3. Low SES African American mothers will not be able to accurately predict attributions their children give for the children's mathematics success and failure performances.

4. Low SES African American children will not be able to accurately predict the attributions their mother will give for the children's mathematics success and failure performances.

5. Low SES African American mothers and children, within the same family, will not be in agreement regarding the children's mathematics success and failure performances.

6. Conclusions about the attributions will not depend on the method--chip distribution instrument or rating scale instrument--used for data collection.

Methods

Participants

This study was conducted in government subsidized housing in Alachua County, which is located in north central Florida. The participants were one hundred low SES

students from the 6th, 7th, and 8th grades, and their mothers. Approximate ages of the students were 12, 13, and 14. This age group was chosen because there is evidence from the developmental literature that children do not differentiate consistently between ability and effort attributions until 12-13 years of age (Nicholls, 1978; Karabenick, & Heller, 1976; Kloosterman, 1983; Eccles, 1985). Although 6th, 7th and 8th grade students are distinguished from each other in the design so that the middle school years could be examined, there are no research questions related to the specific grade or age level.

Criteria for Selection

From a list of 325 mothers with children in the 6th, 7th, and 8th grades obtained from the Alachua County Housing Authority, 100 volunteers were chosen. Fifty mothers and their children were assigned to for the rating scale procedure and fifty mothers and their children were assigned to for the chip distribution procedure. An attempt was made to select an equal number of boys and girls from the volunteering families.

Pre-Selection Process

The researcher interviewed all potential mothers who volunteered for this study. The interview consisted of a series of questions:

"Is your child in middle school--6th, 7th, or 8th grade?"

"Is your child in special educations classes: this includes learning disabled, mentally handicapped or emotionally handicapped classes?"

"Do you receive a copy of your child's report card, and if you are selected for the study, can you locate, and bring with you, your child's most recent report card?"

Participating families lived in government subsidized housing. All children selected for the study met the following criteria:

1. Students were in the 6th, 7th, or 8th grade regular education classes. Although a large number of low SES African American children are in remedial or special education classes, students who spent a majority of their day in regular classrooms were classified as being in regular classes for this study.

2. Participating families had a copy of the student's most recent report card. Student grades, however, were not a selection factor.

3. Only one child per family was selected.

Mothers and children not meeting selection criteria were thanked for their interest, but were not selected.

The distribution of mothers and children by grade, gender, and method is shown in Tables 3-1 and 3-2.

Table 3-1

Sample Size for Rating Scale Respondents

Grade	Child's Sex	Mothers	Children
6	M	9	9
	F	8	8
7	M	9	9
	F	7	7
8	M	10	10
	F	7	7
TOTALS		50	50

Table 3-2

Sample Size for Chip Distribution Respondents

Grade	Child's Sex	Mothers	Children
6	M	6	6
	F	4	4
7	M	12	12
	F	10	10
8	M	14	14
	F	4	4
TOTALS		50	50

Instrumentation

In the present study, two methods, the chip distribution method and the rating scale method, were selected from methods used in previous research (see Holloway & Hess, 1982; 1984; Parsons, Adler, & Kaczala, 1982; and Yamauchi, 1989). For both samples, the instruments consisted of questions about attributions and predictions for the children and for the mothers.

Instrumentation for the children was identical to that used by mothers except for word changes that make the instrument appropriate for children. The questionnaires were

designed to elicit 22 responses from the child and 22 responses from the mother in each procedure (See Appendix C and D).

The Chip Distribution Method. The chip distribution procedure was used in the research of Hess, Chih-Mei, and McDevitt (1987), Holloway and Hess (1982; 1984), and Holloway, Kashiwagi, Hess, and Azuma (1986). Ten chips are given to the mother or child, who is then asked to place the ten chips in 5 categories. The five categories represent the five attributions in the study (ability, effort, training at school, training at home, and luck). The ten chips can be distributed in any pattern. The chip distribution instrument consisted of 5 choices for success, 5 choices for failure, 5 choices for success prediction, and 5 choices for failure prediction. Each card had an attribution phrase on it. For the success condition these phrases were used for the mothers:

My child has natural ability for math.

My child tries hard in math.

My child has had good training at school in math.

Ny child has had good training at home in math.

My child has been lucky in math.

Wording changes were made to adapt these phrases to the other conditions.

The Rating Scale Method. The rating scale procedure came from the research of Bar-Tal and Guttmann (1981), Parsons, Adler, and Kaczala (1982), Yee and Eccles (1988), and Yamauchi (1989).

For the rating scale instrument, the Holloway and Hess (1982; 1984) distribution of chips was replaced by 9-point rating scales like those used by the Graham and Long

(1986) study. Every portion of the instrument was identical except instead of using chips to weight the attributions, ratings scales were used to rate the attributions.

The prediction portion of the chip distribution and rating scale procedures were used as an adaptation from the Yamauchi (1989) study that introduced the prediction component in a study of Japanese mothers and their children about mathematics performance. While the Yamauchi (1989) study asked only children to predict their mother's causal attributions for the children's mathematics success and failure, in this study mothers were asked to predict the attributions their children would give for the children's mathematics success and failure, and children were asked to predict the attributions their mothers would give for the children's mathematics success and failure.

Procedures

After volunteers agreed to participate, the studies were explained and informed consent obtained, mothers were tested on the first visit and their children were tested on the second visit in their homes. All study materials were read aloud while the subjects read silently.

Mothers were not present when their child was "tested", and the child was not present when their mother was "tested."

Sample A: The Rating Scales Procedure. While looking at their children's report card, mothers were first asked to judge how well their children had performed in 6th, 7th or 8th grade mathematics on their most recent report card relative to other members of their class. (Therefore, success and failure are considered in relation to other class members and is referred to as relative success and relative failure--Holloway & Hess,

1982; 1984.) The mothers were to indicate the children's level of performance on a 6-point scale.

Mothers: relative success condition. In this condition, the objective was to help the mother think of her child as a "relative success." For the relative success condition the interviewer first noted the response made by the mothers. If a mother rated her child's performance as a 1 or 2, the interviewer said: "You rated your child's mathematics performance as better than some of the other children in his/her class. Why do you think your child did this well?"

If a mother rated her child's performance as a 3 or 4, "better than many" was substituted into the above sentence. If a mother rated her child's performance as a 5, "better than most" was read in the sentence. If a mother rated her child's performance as a 6, the interviewer stated: "You have rated your child's mathematics performance as the very best in the class. Why do you think your child did this well?"

The interviewer then gives the mothers rating scales forms which ask them to rate each attribution (reason) for their children's performance by circling the number that best indicates how much a reason causes their child's mathematics performance. The scale ranged from 1 to 9; 1 indicated the reason was definitely not a cause to 9 indicating the reason was definitely a cause.

Mothers: relative failure condition. An analogous procedure was used for questions about relatively low performance (relative failure). In this condition the question was, "You indicated that your child wasn't doing the very best in the class. Why

do you think he/she isn't doing even better in mathematics?" The purpose was to have the mother think of her child as a "relative failure."

If the mothers reported that the children were doing the very best in the class, the interviewer suggested that the children might not be the best in the school district and asked why the children were not doing even better.

Prediction. In the prediction portion of the study, a mother was asked to predict how her child would rate his or her mathematics performance based on the most recent report card. The mothers were to indicate their predictions about their children's rating on a 6-point scale.

Mothers: relative success condition. For the relative success condition the interviewer first noted the response made by the mothers to the prediction question. If the mothers predicted their children would rate their performance as a 1 or 2, the interviewer said, "You predicted your child would rate his/her mathematics performance as better than some of the other children in his/her class. Why do you think your child thought he/she did this well?"

If the mothers predicted their children would rate their mathematics performance as a 3 or 4, "better than many" would be substituted into the above sentence. If the mothers predicted their children would rate their mathematics performance as a 5, "better than most" was read in the sentence. If the mothers predicted their children would rate the children's performance as a 6, the interviewer stated, "You have predicted that your child would rate his/her mathematics performance as the very best in the class. Why do you think your child thinks he/she did this well?"

The interviewer next gave the mothers the rating scale forms, indicating the attributions (reasons) for the children's performance and then asked the mothers to complete the 9-point scales by circling the number that best indicated the reason the child would give for the child's mathematics performance.

Mothers: relative failure condition. An analogous procedure was used to ask mothers to predict how their children would respond about relatively low performance.

In the Rating Scale procedures each mother provided a total of 22 responses. Mothers rated their children's level of performance in mathematics (1 rating). Then the mothers rated five success and five failure attributions (10 ratings). Mothers predicted how their children would rate their level of mathematics performance (1 rating). They predicted their children's attributions for their mathematics performance by rating their prediction of their child's response giving five success and five failure attributions (10 ratings).

Rating Scale Procedures for children. In the Rating Scale Procedure, the procedures designed for children were identical to those procedures for mothers except for word changes that made the procedures appropriate for children. There were a total of 22 ratings for each child.

Sample B: Chip Distribution Procedure. The procedures for the Chip Distribution portions of the study were identical to the Rating Scale procedures except that the 5 attributions were written on 5 cards and 10 chips were given to subjects to weight the importance of each attribution as a cause of their child's mathematics performance.

Variables Under Investigation

There were three independent variables under investigation in this study: (1) informant: mother/child, and (2) Sex: male/female and (3) grade (6th, 7th, and 8th), in each outcome situation (success and failure). The five dependent variables in each success and failure outcome were causal attribution scores for ability, effort, training at school, training at home, and luck as measured by the rating scale procedure and the chip distribution procedure.

Research Design

The design for this study is a 3 (grades) x 2 (male/female) x 2 (mother/child) x 5 (attributions) within subjects design with repeated measures on the last two factors. This design was used for Sample A and Sample B.

Data Analysis

The data from this study in each outcome were analyzed using analysis of variance (ANOVA). Analyses were computed separately for mothers' and children's predictions. To determine attribution agreement within the family, correlations were performed on parent and child pairs within the same family. Scores of parents and children were correlated with Pearson product-moment correlations for each of the 5 success and 5 failure attributions in each sample.

CHAPTER 4

RESULTS

The primary purpose of this study was to compare the causal attributions that low SES African American mothers and their children give for mathematics performance. A secondary purpose was to examine whether the rating scale instrument and the chip distribution instrument yield similar results when measuring causal attributions given by low SES African American mothers and children for mathematics performance.

The results presented in this chapter are based on the data collected from 6th, 7th, and 8th grade students and their mothers in six separate government-subsidized housing projects in Alachua county, Florida. Attribution questionnaires were administered to 200 participants, including 100 parents and 100 children who volunteered to participate in the study. The sample pool was divided in half. Fifty mothers and 50 children were administered the rating scale instrument. Fifty mothers and 50 children were administered the chip distribution instrument.

For both samples, the data analysis included a grade (3) x child sex (2) x respondent (2) by type of attribution (5) with repeated measures on the last two factors. Separate analyses were conducted for success and for failure attributions, and additionally, to examine mothers' and children's success and failure predictions. Further, Pearson-product moment correlations were used to explore the relationship of mothers

and children's beliefs within individual families and of mothers' and children's performance evaluations of the children's mathematics grade.

Mother's and Children's Success and Failure Attributions for Mathematics Performance: Rating Scale Method

Mothers and children were asked to evaluate on a six-point scale the mathematics grade from the children's most recent report card. The six-point scale ranged for 1 (not doing as well as most) to 6 (doing the very best in the class). Mothers were then asked by the interviewer "Why is your child doing this well?" and children were asked "Why are you doing this well?" Mothers and children rated on 9-point scales the relative importance of five attributional items. The scales ranged from 1 (definitely not a cause) to 9 (definitely a cause). The items were ability, effort, training at school, training at home, and luck for both success and failure conditions. Therefore, relative success in this study is actually mothers' and children's evaluation of the children's current level of mathematics performance. For relative failure, mothers and children were asked by the interviewer, "Why did your child not do even better?" (for mothers), and "Why aren't you doing even better?" (for the children). This condition examines relative failure as a judgement in contrast to the current level of performance.

It was hypothesized that low SES African American mothers would not agree with their children about the causes of the children's success and failure in mathematics.

For the success condition, means and standard deviations for each of the attributional items are presented in Table 4-1. The results of an ANOVA of mothers' and children's mathematics success attribution means are presented in Table 4-2. The results

in Table 4-2 include a significant Respondent x Type of Attribution interaction and a significant main effect of attribution, indicating some disagreement between mothers and children about the relative importance they place on the five types of attributions for success in mathematics. Mean attributions as a function of respondent and type of attribution are reported in Table 4-3. These means describe the nature of the disagreement between mothers and children about the relative importance of the five types of attributions. Mothers and children are in agreement about the relative importance of the five types of attributions as causes of success. On average, both mothers and children rate effort as the most important, followed by school, home, ability, and luck. However, mothers put less emphasis than do their children on each type of attribution. The most striking difference between mothers and children is the luck attribution. Children rate luck almost as important as ability; mothers rate luck as less important than do their children and as less important than ability. Therefore the largest difference between mother's and children's beliefs about the causes of success in mathematics is the way luck is perceived.

In Table 4-2, there is a significant Child's Gender x Type of Attribution interaction. Means for interpreting this interaction are reported in Table 4-4. Each mean in Table 4-4 is an average of a mean for mothers and the mean for children, with the means calculated across grades. Thus the means in Table 4-4 reflect both children's and mothers' attributions for success. The results in Table 4-4 indicate that mother--son dyads tend to agree with mother--daughter dyads about the relative importance of the five causes: effort is most important followed by school, home, ability and luck. Mother--

daughter dyads rate effort, school, and luck as more important than do mother--son dyads, whereas mother--son dyads rate ability and home as more important than do mother--daughter dyads.

Examination of Table 4-4 analysis shows that in comparison to mother--daughter dyads, mother--son dyads believe success in mathematics depends more heavily on ability. Mother--son dyads also believe effort is less responsible for success than do mother-daughter dyads in mathematics. Mother--daughter dyads believe that school training is more important for mathematics success than do mother--son dyads. Mother--son dyads believe home training is more important for mathematics success than do mother--daughter dyads. Finally, mother--daughter dyads depend more on the luck attribution for mathematics success than do mother--son dyads. For mother--daughter dyads, luck and ability are of equal importance for successful mathematics achievement.

The absence of a Respondent x Child's Sex x Type of Attribution interaction implies that the pattern of differences between boys' and girls' mean success attribution is similar to the pattern of gender related difference between the mean success attributions made by boys' and girls' mothers. As a result the means in Table 4-4 represent the pattern of responding by both children and mothers. However, to avoid relying unduly on the nonsignificant interaction, the means by child's sex for mothers and children are reported separately in Table 4-5. Most of the generalizations that emerge from an inspection of Table 4-4 also emerge from an inspection of Table 4-5. The exceptions are that in this

Table 4-1 Ratings
Mother's and Children's Mathematics Success Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	4.1	8.9	8.6	6.5	5.1
			SD	2.4	0.4	0.7	1.5	3.1
		Mother	M	5.4	8.3	8.3	7.1	3.4
			SD	2.8	1.4	1.5	1.9	3.1
	Male	Child	M	6.2	8.1	8.4	8.0	3.4
			SD	2.1	2.0	1.3	1.7	3.7
		Mother	M	5.8	8.4	5.9	5.8	1.6
			SD	3.2	0.9	2.4	2.1	1.7
7	Female	Child	M	2.1	8.9	5.6	3.9	3.4
			SD	2.0	0.4	1.7	2.5	2.4
		Mother	M	1.6	8.0	7.9	4.4	2.0
			SD	1.5	1.9	2.0	3.6	1.9
	Male	Child	M	6.6	7.1	6.9	5.6	4.3
			SD	3.0	2.8	1.8	2.3	3.4
		Mother	M	5.2	7.2	6.7	6.0	1.9
			SD	2.7	1.6	2.1	1.6	1.8
8	Female	Child	M	4.7	8.7	8.3	5.7	5.3
			SD	3.4	0.8	1.9	3.3	4.1
		Mother	M	4.4	8.1	6.6	5.6	3.3
			SD	2.6	2.3	3.0	2.8	3.1
	Male	Child	M	4.7	7.2	7.1	6.5	5.0
			SD	2.8	2.1	2.3	2.0	3.6
		Mother	M	4.3	6.6	5.9	6.3	1.7
			SD	3.0	2.3	2.6	2.2	1.3

Table 4-2 Ratings

Summary of ANOVA for Success Attributions

Source	df	SS	MS	F	p
Between					
Grade (G)	2	100.06	50.03	5.55	0.0071
Sex (S)	1	0.02	0.02	0.00	0.9651
G x S	2	55.98	27.99	3.10	0.0549
Error	44	396.91	9.02		
Within					
Respondent(R)	1	63.14	63.14	9.28	0.0039
R x G	2	9.89	4.95	0.73	0.4889
R x S	1	14.57	14.57	2.14	0.1504
R x G x S	2	5.05	2.52	0.37	0.6921
Error	44	299.22	6.80		
Attribution (A)	4	1368.73	342.18	57.82	0.0001
A x G	8	40.19	5.02	0.85	0.5611
A x S	4	143.24	35.81	6.05	0.0001
A x G x S	8	58.34	7.29	1.23	0.2828
Error	176	1041.65	5.92		
R x A	4	64.68	16.17	3.85	0.0050
R x A x G	8	42.03	5.25	1.25	0.2726
R x A x S	4	14.66	3.67	0.87	0.4816
R x A x G x S	8	22.26	2.78	0.66	0.7241
Error	176	739.46	4.20		

Table 4-3 Ratings

Success Means as a Function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	4.7	8.1	7.5	6.0	4.4
Mother	4.4	7.8	6.8	5.8	2.3

Table 4-4 Ratings

Success Mean Ratings as a Function of Sex and Type of Attribution

Sex	Ability	Effort	School	Home	Luck
Boy	5.4	7.4	6.8	6.3	3.0
Girl	3.7	8.4	7.5	5.5	3.7

sample, girls mothers' rate school as more important than do boys' mothers, but girls do not rate school as more important than do boys.

Table 4-6 represents a main effect for grade. Examination of Table 4-6 means indicate that mothers and children in sixth grade place more emphasis on the five types of attributions than do mothers and children in either the seventh or the eighth grade. Seventh grade mothers and children tend to place less emphasis on the five types of attributions.

Pearson-product moment correlation coefficients presented in Table 4-7 indicate that mothers and children within the same family do not agree about the causes of mathematics success. Mothers and children were also not in agreement about the

Table 4-5 Ratings

Success Mean Ratings as a Function of Respondent, Child's Sex, and Type of Attribution

Respondent	Sex	Ability	Effort	School	Home	Luck
Child	Boy	5.8	7.5	7.4	6.7	4.2
	Girl	3.6	8.8	7.4	5.3	4.6
Mother	Boy	5.1	7.4	6.1	6.0	1.7
	Girl	3.7	8.1	7.5	5.7	2.8

Table 4-6 Ratings

Success Attribution Means by Grade

Grade	Means
6	6.3
7	5.2
8	5.8

children's performance in mathematics. Of the six correlations, only two coefficients were significant: home training, r = .42; luck, r = .29. Even these were fairly small. Overall, mothers and children within the same family were in disagreement about the causes of the children's successful mathematics performance and about how well the children were actually performing in the class.

For the failure condition, means and standard deviations for each of the attributional items are presented in Table 4-8. The results of an ANOVA of mothers' and n's mathematics failure attribution means are presented in Table 4-9. The results for

Table 4-7 Ratings

Pearson Correlation Coefficients Between Mother's and Children's Success Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.19	.21	-.01	.42*	.29*	.11

* = $p<.05$

children's mathematics failure attribution means are presented in Table 4-9. The results in Table 4-9 include a significant Respondent x Type of Attribution interaction and a significant main effect of attribution. These results indicate disagreement between mothers and children about the relative importance they place on the five types of attributions for mathematics failure. Mean attributions as a function of respondent and type of attribution are reported in Table 4-10. These means show the nature of the disagreement between mothers and children about the relative importance of the five types of attributions as causes of mathematics failure. Mothers and children were not in agreement about the relative importance of the five types of attributions. On average, mothers rated effort as most important followed by school, home, ability, and luck. However, children rated home training as most important followed by effort, luck, and school training (which were rated equally,) then ability.

The largest discrepancy between mothers' and children's attributions for mathematics failure is how they view effort. Mothers put more emphasis on the effort

Table 4-8 Ratings
Mother's and Children's Mathematics Failure Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	4.0	5.1	2.6	3.5	2.5
			SD	2.9	3.6	2.4	2.1	2.5
		Mother	M	3.4	6.6	2.3	3.5	2.3
			SD	2.7	3.5	2.3	2.9	2.4
	Male	Child	M	2.9	3.4	3.9	4.3	4.4
			SD	2.8	3.4	3.6	3.8	3.6
		Mother	M	2.6	5.4	3.7	3.6	1.2
			SD	2.0	3.8	3.0	2.1	0.7
7	Female	Child	M	2.0	2.3	3.4	4.4	3.0
			SD	1.9	2.2	3.6	1.9	2.2
		Mother	M	1.6	7.0	1.6	3.9	1.0
			SD	1.5	3.1	1.5	3.0	0.0
	Male	Child	M	2.4	3.6	3.6	3.1	3.3
			SD	1.9	3.0	2.7	2.8	2.7
		Mother	M	3.2	5.0	5.4	3.1	1.9
			SD	2.5	3.8	3.3	2.2	1.5
8	Female	Child	M	2.3	3.3	3.9	3.6	3.3
			SD	2.2	3.0	3.7	3.8	3.9
		Mother	M	2.9	7.1	2.9	1.9	1.0
			SD	3.1	3.0	3.1	1.6	0.0
	Male	Child	M	4.5	5.3	3.1	5.0	4.1
			SD	3.4	3.1	2.7	3.0	3.2
		Mother	M	3.3	6.8	4.1	2.8	1.4
			SD	2.3	2.7	3.4	1.9	1.0

Table 4-9 Ratings

Summary of ANOVA for Failure Attributions

Source	df	SS	MS	F	p
Between					
Grade (G)	2	13.34	6.67	0.42	0.6624
Sex (S)	1	21.72	21.72	1.35	0.2508
G x S	2	15.90	7.95	0.50	0.6126
Error	44	705.90	16.04		
Within					
Respondent (R)	1	2.13	2.13	0.19	0.6636
R x G	2	9.57	4.79	0.43	0.6530
R x S	1	1.25	1.25	0.11	0.7392
R x G x S	2	8.78	4.39	0.39	0.6761
Error	44	489.27	11.12		
Attribution (A)	4	389.59	97.40	14.38	0.0001
A x G	8	34.59	4.32	0.64	0.7445
A x S	4	29.90	7.48	1.10	0.3562
A x G x S	8	65.01	8.13	1.20	0.3014
Error	176	1191.71	6.77		
R x A	4	268.49	67.12	11.81	0.0001
R x A x G	8	18.06	2.26	0.40	0.9211
R x A x S	4	46.27	11.57	2.03	0.0916
R x A x G x S	8	45.57	5.70	1.00	0.4364
Error	176	1000.60	5.69		

Table 4-10 Ratings

Failure Means as a Function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	3.0	3.8	3.4	4.0	3.4
Mother	2.8	6.3	3.3	3.1	1.4

Table 4-11 Ratings

Pearson Correlation Coefficients Between Mother's and Children's Failure Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.20	.19	.14	-.01	.09	.11

* = $p<.05$

attribution than do children. Although children view effort as important in mathematics failure, they tend to place slightly more emphasis on home training. Another major difference between mothers and children regards the luck attribution. Children rate luck equally as important as school training while mothers rate luck as the least important cause of their children's mathematics failure.

Pearson-product moment correlation coefficients presented in Table 4-11 indicate that mothers and children within the same family were not in agreement when evaluating the children's mathematics performance and were also not in agreement about the causes of mathematics failure. Of the six correlations, none of the coefficients were significant.

Mothers' Predictions of Their Children's Mathematics Success and Failure Attributions: Rating Scale Method

Mothers were asked to predict the attributions their children would choose for mathematics success and failure. Mothers predicted on a 6-point scale how their children would evaluate the mathematics grade on their most recent report card. For predicted success, the interviewer asked mothers "Why do you think your child thinks he or she is doing this well?" For predicted failure, the interviewer asked "Why do you think that your child thinks he or she is not doing even better?" Mothers predicted on 9-point scales the relative importance their children would place on the five attributional items. The 9-point scales ranged from 1 (definitely not a cause) to 9 (definitely a cause). The attributional items were: ability, effort, school training, home training, and luck. It was hypothesized that African American mothers will not accurately predict their children's mathematics success and failure attributions. For the predicted success condition, Pearson product-moment correlation coefficients between children's actual mathematics success attributions and mothers' predictions of their children's mathematics success attributions within the family are presented in Table 4-12. The results of Table 4-12 indicate that mothers cannot accurately predict their children's mathematics success attributions within the family. Of the six correlations, four of the coefficients were not significant. The two coefficients that were significant were home training, $r = .39$; and luck, $r = .29$, and these were relatively small. Therefore, mothers were not very accurate in predicting their children's mathematics success attributions within the family. Mothers

were also unable to accurately predict how their children would evaluate their mathematics performance.

Means and standard deviations for children's actual mathematics success attributions and mothers' predicted success attributions are presented in Table 4-13. The results of an ANOVA of children's actual mathematics success attributions and mothers' predicted success attributions are reported in Table 4-14.

Table 4-12 Ratings

Pearson Correlation Coefficients Between Children's Success Attributions and Mothers's Predictions of Their Children's Success Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.13	-.01	.23	.37*	.29*	.16

* = $p<.05$

There are two types of effects in Table 4-14, effects involving respondent and effects that do not involve respondent. The latter are analyses of the sum of a mother's predictions and a child's ratings, and consequently, are not meaningful effects. The former are comparisons of mothers' predictions and children's ratings, and are meaningful effects. Consequently, this section will focus on effects involving respondent.

The results in Table 4-14 include a significant Respondent x Type of Attributions interaction and a significant main effect of attribution suggesting some disagreement about the relative importance the children place on the five types of attributions and the mothers' predictions of their children's attributions. Mean attributions as a function of respondent and type of attribution are reported in Table 4-15. These means show the

nature of the disagreement between mother's predicted success attributions and children's actual success attributions when rating the importance of the five types of attributions. Mothers' average predicted success attributions tended to agree with children's average actual success attributions about the relative importance of the five types of attributions as causes of mathematics success. On average, both mothers and children rate effort as the most important, followed by school training, home training, ability, and luck. However, mothers' average predicted success attributions were not accurate in predicting the emphasis their children would place on the five types of attributions. The most obvious difference between mothers' average predicted success attributions and children's actual success attributions involved the ability and luck attributions. Mothers tended to overestimate the importance their children would place on ability, and underestimate the importance their children would place on luck. Nevertheless, on average, mothers' predictions about the emphasis their children would place on effort, school training, and home training were relatively close to their children's actual mathematics success attributions.

For the predicted failure condition, Pearson product-moment correlation coefficients between children's actual mathematics failure attributionsand mothers' predicted mathematics failure attributions within the family. Only two coefficients were significant. These were school training, $r = .32$; home training, $r = .43$ The four remaining coefficients, ability, effort, luck, and the evaluation were not significant.

Table 4-13 Ratings
Children's Mathematics Success Attributions and Mother's Predictions of Their Children's Mathematics Success Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	4.1	8.9	8.6	6.5	5.1
			SD	2.4	0.4	0.7	1.5	3.1
		Mother	M	4.8	8.0	6.8	6.5	3.4
			SD	3.8	2.8	3.0	2.8	2.6
	Male	Child	M	6.2	8.1	8.4	8.0	3.4
			SD	2.1	2.0	1.3	1.7	3.7
		Mother	M	5.9	8.3	6.7	6.7	4.1
			SD	3.2	1.4	2.5	1.7	3.1
7	Female	Child	M	2.1	8.9	5.6	3.9	3.4
			SD	2.0	0.4	1.7	2.5	2.4
		Mother	M	4.0	7.4	6.9	5.0	2.7
			SD	3.2	2.1	3.1	3.2	2.4
	Male	Child	M	6.6	7.1	6.9	5.6	4.3
			SD	3.0	2.8	1.8	2.3	3.4
		Mother	M	6.2	7.8	5.6	5.6	2.8
			SD	1.9	1.3	3.0	1.0	2.2
8	Female	Child	M	4.7	8.7	8.3	5.7	5.3
			SD	3.4	0.8	1.9	3.3	4.1
		Mother	M	6.7	7.9	6.3	6.9	3.3
			SD	3.0	2.2	3.0	2.5	3.9
	Male	Child	M	4.7	7.2	7.1	6.5	5.0
			SD	2.8	2.1	2.3	2.0	3.6
		Mother	M	4.4	7.2	5.6	6.3	2.5
			SD	2.6	1.5	2.9	2.0	1.9

Table 4-14 Ratings

Summary of ANOVA for Children's Mathematics Success Attributions and Mother's Predictions of Their Children's Mathematics Success Attributions

Source	df	SS	MS	F	p
Between					
Grade (G)	2	84.89	42.44	3.65	0.0340
Sex (S)	1	2.79	2.79	0.24	0.6262
G x S	2	51.74	25.87	2.23	0.1199
Error	44	511.15	11.61		
Within					
Respondent (R)	1	23.26	23.26	3.66	0.0623
R x G	2	9.36	4.68	0.74	0.4848
R x S	1	5.19	5.19	0.82	0.3715
R x G x S	2	7.79	3.89	0.61	0.5467
Error	44	279.81	6.36		
Attribution (A)	4	1026.74	256.68	40.02	0.0001
A x G	8	33.18	4.15	0.65	0.7376
A x S	4	62.48	15.62	2.44	0.0490
A x G x S	8	48.12	6.01	0.94	0.4868
Error	176	1128.88	6.41		
R x A	4	66.52	16.63	3.40	0.0105
R x A x G	8	30.22	3.78	0.77	0.6276
R x A x S	4	39.78	9.95	2.03	0.0917
R x A x G x S	8	21.16	2.64	0.54	0.8246
Error	176	860.77	4.90		

Table 4-15 Ratings

Predicted Success Mean Ratings as a Function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	4.7	8.1	7.5	6.0	4.4
Mother	5.3	7.8	7.8	6.1	3.1

Table 4-16 Ratings

Pearson Correlation Coefficients Between Children's Failure Attributions and Mothers Prediction of Children's Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
-.19	.26	.32*	.43*	.12	.16

* = $p<.05$

Means and standard deviations for children's actual mathematics failure attributions and mothers predicted failure attributions are presented in Table 4-17. The results of an ANOVA of children's actual failure attributions and mothers' predicted failure attributions are reported in Table 4-18. There are two types of effects in Table 4-18, effects involving Respondent and effects that do not involve respondent. The only meaningful effects are those involving respondent. Consequently this section will focus on effects involving only the respondent. Examination of Table 4-18 indicates a significant Respondent x Type of Attribution interaction indicating some discrepancy about the relative importance children place on the five types of attributions and the mothers' predictions of their children's attributions. Mean attributions as a function of

Respondent and Type of Attribution are reported in Table 4-19. Table 4-19 shows that mothers' predicted failure attributions of their children's mathematics performance were not in agreement for the relative importance of the five types of attribution. Also, mothers predictions were not in agreement with the emphasis their children placed on each of the five types of attributions. The only attribution mothers came close to predicting about their children's mathematics failure was ability. It seems mothers knew their children would not rate their ability as a cause of mathematics failure.

Children's Prediction's of Their Mother's Mathematics Success and Failure Attributions: Rating Scale Method

Children were asked to predict the attributions their mothers would choose for the children's mathematics success and failure. Children predicted on a 6-point scale how their mothers would rate the mathematics grade on their most recent report card. For predicted success, the interviewer asked children, "Why do you think your mother thinks you are doing this well?" For predicted failure, the interviewer asked "Why do you think, your mother thinks you are not doing even better?" Children predicted on 9-point scales the relative importance their mothers would place on the five attributional items. The 9-point scales ranged from 1 (definitely not a cause) to 9 (definitely a cause). The attributional items were ability, effort, training at school, training at home and luck. It was hypothesized that African American children will not accurately predict their mother's mathematics success and failure attributions.

For the predicted success condition, Pearson product-moment correlation coefficients between mothers' actual mathematics success attributions and children's

Table 4-17 Ratings
Children's Mathematics Failure Attributions and Mother's Predictions of Their Children's Mathematics Failure Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	4.0	5.1	2.6	3.5	2.5
			SD	2.9	3.6	2.4	2.1	2.5
		Mother	M	2.5	4.6	2.4	3.9	2.3
			SD	2.1	3.5	2.7	3.0	2.4
	Male	Child	M	2.9	3.4	3.9	4.3	4.4
			SD	2.8	3.4	3.6	3.8	3.6
		Mother	M	3.2	4.7	3.7	3.4	3.0
			SD	2.5	3.4	3.1	2.0	2.8
7	Female	Child	M	2.0	2.3	3.4	4.4	3.0
			SD	1.9	2.2	3.4	1.9	2.2
		Mother	M	3.9	5.3	3.9	2.4	1.0
			SD	3.8	4.0	3.8	1.9	0.0
	Male	Child	M	2.4	3.6	3.6	3.1	3.3
			SD	1.9	3.0	2.7	2.8	2.7
		Mother	M	3.4	4.8	5.4	3.6	2.4
			SD	2.0	3.3	3.0	2.1	1.9
8	Female	Child	M	2.3	3.3	3.9	3.6	3.3
			SD	2.2	3.0	3.7	3.8	3.9
		Mother	M	4.1	4.4	4.9	3.7	2.7
			SD	3.6	3.6	3.4	2.8	3.1
	Male	Child	M	4.5	5.3	3.1	5.0	4.1
			SD	3.3	3.1	2.7	3.0	3.2
		Mother	M	2.7	6.3	5.0	3.0	3.3
			SD	2.5	3.0	3.5	2.0	2.6

Table 4-18 Ratings

Summary of ANOVA for Children's Mathematics Failure Attributions and Mother's Predictions of their Children's Mathematics Failure Attributions

Source	df	SS	MS	F	p
Between					
Grade (G)	2	27.13	13.57	0.66	0.5203
Sex (S)	1	26.28	26.28	1.28	0.2632
G x S	2	1.50	0.75	0.04	0.9640
Error	44	900.05	20.46		
Within					
Respondent (R)	1	1.87	1.87	0.22	0.6393
R x G	2	13.65	6.82	0.81	0.4496
R x S	1	0.43	0.43	0.05	0.8228
R x G x S	2	13.74	6.87	0.82	0.4471
Error	44	368.81	8.38		
Attribution (A)	4	131.45	32.86	4.21	0.0028
A x G	8	28.21	3.53	0.45	0.8882
A x S	4	13.24	3.32	0.42	0.7910
A x G x S	8	45.82	5.73	0.73	0.6614
Error	176	1373.57	7.80		
R x A	4	84.55	21.14	3.29	0.0124
R x A x G	8	34.37	4.30	0.67	0.7181
R x A x S	4	9.09	2.27	0.35	0.8409
R x A x G x S	8	61.62	7.70	1.20	0.3017
Error	176	1129.99	6.42		

Table 4-19 Ratings
Predicted Failure Mean Ratings as a Function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	3.0	3.8	3.4	4.0	3.4
Mother	3.3	5.0	4.2	3.3	2.4

Table 4-20 Ratings

Pearson Correlation Coefficients Between Mother's Success Attributions and Children's Predictions of Mothers's Success Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.23	.26	.06	.17	.16	.31*

* = $p<.05$

predictions of their mothers' mathematics success attributions within the family are presented in Table 4-20. The results of Table 4-20 indicate that children were not able to predict accurately their mothers' mathematics success attributions within the family. Of the six correlations, five were not significant. However, a small significant correlation was found when children predicted how their mothers would evaluate their mathematics performance.

Means and standard deviations for mothers' actual mathematics success attributions and children's predicted success attributions are presented in Table 4-21. The results of an ANOVA of mothers' actual mathematics success attributions and children's predicted success attributions are reported in Table 4-22. As in the preceding analyses

Table 4-21 Ratings
Mother's Mathematics Success Attributions and Children's Predictions of Their Mother's Mathematics Success Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	4.9	8.0	8.3	6.9	5.8
			SD	3.3	1.9	1.8	1.6	3.5
		Mother	M	5.4	8.3	8.3	7.1	3.4
			SD	2.8	1.4	1.5	1.9	3.1
	Male	Child	M	6.8	7.7	7.6	8.1	3.0
			SD	1.9	2.5	2.8	1.5	3.2
		Mother	M	5.8	8.4	5.9	5.8	1.6
			SD	3.2	0.9	2.4	2.1	1.7
7	Female	Child	M	4.0	7.7	7.0	6.0	3.1
			SD	2.1	1.7	3.1	2.0	2.5
		Mother	M	1.6	8.0	7.9	4.4	2.0
			SD	1.5	1.9	2.0	3.6	1.9
	Male	Child	M	5.3	7.0	7.7	5.6	2.4
			SD	.33	2.0	1.5	3.2	2.2
		Mother	M	5.2	7.2	6.7	6.0	1.9
			SD	2.7	1.6	2.1	1.6	1.8
8	Female	Child	M	4.0	8.6	8.3	7.6	2.9
			SD	3.6	1.1	1.9	2.5	2.3
		Mother	M	4.4	8.1	6.6	5.6	3.3
			SD	2.6	2.3	3.0	2.8	3.1
	Male	Child	M	5.2	6.4	7.7	6.8	4.5
			SD	2.8	2.3	1.4	2.8	3.5
		Mother	M	4.3	6.6	5.9	6.3	1.7
			SD	3.0	2.3	2.6	2.2	1.3

Table 4-22 Ratings
Summary of ANOVA for Mother's Mathematics Success Attributions and Children's Predictions of Their Mother's Mathematics Success Attributions

Source	df	SS	MS	F	p
Between					
Grade (G)	2	82.89	41.44	3.65	0.0341
Sex (S)	1	5.19	5.19	0.46	0.5022
G x S	2	17.83	8.91	0.79	0.4622
Error	44	499.24	11.35		
Within					
Respondent(R)	1	60.90	60.90	8.82	0.0048
R x G	2	3.37	1.68	0.24	0.7851
R x S	1	1.98	1.98	0.29	0.5954
R x G x S	2	11.67	5.84	0.85	0.4364
Error	44	303.89	6.91		
Attribution (A)	4	1496.43	374.11	70.14	0.0001
A x G	8	33.91	4.24	0.79	0.6080
A x S	4	97.91	24.48	4.59	0.0015
A x G x S	8	46.01	5.76	1.08	0.3805
Error	176	938.77	5.33		
R x A	4	32.71	8.18	1.81	0.1290
R x A x G	8	22.26	2.78	0.62	0.7639
R x A x S	4	10.49	2.62	0.58	0.6772
R x A x G x S	8	59.74	7.47	1.65	0.1133
Error	176	795.55	4.52		

Table 4-23 Ratings
Predicted Success Means by Respondent

Respondent	Means
Child	6.1
Mother	5.4

involving predictions, only the effects involving respondent are meaningful, and of these effects, only the respondent effect was significant.

Table 4-23 shows a main effect for respondent indicating a discrepancy between children's predicted mathematics success attributions and mothers' actual mathematics success attributions. Children tended to overestimate the emphasis their mothers would place on the five types of attributions about the children's mathematics success.

For the predicted failure condition, Pearson product-moment coefficients between mothers' actual mathematics failure attributions and children's predictions of their mother's mathematics failure attributions within the family are presented in Table 4-24. The results of Table 4-24 indicate that children were not able to accurately predict their mothers' mathematics failure attributions nor were they able to predict how their mothers would evaluate their mathematics performance. Only one of the six correlations was significant: effort, $r = .29$, which does not show a strong relationship.

Table 4-24 Ratings

Pearson Correlation Coefficients Between Mother's Failure Attributions and Children's Predictions of Mother's Failure Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.06	.29*	.20	.13	.24	.16

* = $p<.05$

Means and standard deviations for mothers' actual mathematics failure attributions and children's predicted failure attributions are presented in Table 4-25. The results of an ANOVA of mothers' actual mathematics failure attributions and children's predicted failure attributions are reported in Table 4-26. Again, the only meaningful effects are those involving respondent.

The results of Table 4-26 include a significant Respondent x Type of attribution interaction indicating some disagreement about the relative importance the children place on the five types of attributions and the mothers' actual mathematics attributions. Mean attributions as a function of respondent and type of attribution are reported in Table 4-27. These means describe the nature of the disagreement between mothers' actual mathematics failure attributions and children's predicted failure attributions for the five types of attributions. On average, mothers rated effort as most important, followed by school, home, ability, and luck. However, children predicted their mothers, on average, would rate effort as most important, followed by home, ability, luck, and school. Therefore, children's predictions were not consistent with mothers actual mathematics

Table 4-25 Ratings
Mother's Mathematics Failure Attributions and Children's Predictions of Their Mother's Mathematics Failure Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	3.5	4.8	2.4	3.4	2.4
			SD	2.1	3.4	2.8	3.1	1.8
		Mother	M	3.4	6.6	2.3	3.5	2.3
			SD	2.7	3.5	2.3	2.8	2.4
	Male	Child	M	3.4	2.8	3.1	4.0	3.2
			SD	3.2	2.8	3.3	3.2	3.5
		Mother	M	2.6	5.4	3.7	3.6	1.2
			SD	2.0	3.8	3.0	2.1	0.7
7	Female	Child	M	3.0	2.0	2.0	2.3	3.7
			SD	2.8	1.7	1.7	1.7	3.0
		Mother	M	1.6	7.0	1.6	3.9	1.0
			SD	1.5	3.1	1.5	3.1	0.0
	Male	Child	M	2.0	2.7	3.5	3.0	3.0
			SD	1.7	2.7	2.8	2.7	2.8
		Mother	M	3.2	5.0	5.4	2.1	1.9
			SD	2.5	3.8	3.3	2.2	1.5
8	Female	Child	M	1.4	5.0	1.9	2.6	1.6
			SD	0.8	3.6	2.3	3.0	1.5
		Mother	M	2.9	7.1	2.9	1.9	1.0
			SD	3.1	3.0	3.1	1.6	0.0
	Male	Child	M	3.8	6.4	3.8	4.8	2.8
			SD	2.7	2.5	3.0	3.0	2.4
		Mother	M	3.3	6.8	4.1	2.8	1.4
			SD	2.3	2.7	3.4	1.9	1.0

Table 4-26 Ratings
Summary of ANOVA for Mother's Mathematics Failure Attributions and Children's Predictions of Their Mother's Mathematics Failure Attributions

Source	df	SS	MS	F	p
Between					
Grade (G)	2	13.14	6.57	0.38	0.6884
Sex (S)	1	31.77	31.77	1.32	0.1842
G x S	2	36.59	18.30	1.05	0.3592
Error	44	768.03	17.46		
Within					
Respondent (R)	1	9.07	9.07	1.22	0.2760
R x G	2	9.26	4.63	0.62	0.5422
R x S	1	4.39	4.39	0.59	0.4476
R x G x S	2	16.48	8.24	1.10	0.3402
Error	44	328.20	7.46		
Attribution (A)	4	494.86	123.71	21.74	0.0001
A x G	8	93.83	11.73	2.06	0.0420
A x S	4	70.04	17.51	3.08	0.0176
A x G x S	8	22.19	2.77	0.49	0.8642
Error	176	1001.68	5.69		
R x A	4	184.29	46.07	8.66	0.0001
R x A x G	8	43.22	5.40	1.02	0.4259
R x A x S	4	16.83	4.21	0.79	0.5323
R x A x G x S	8	43.14	5.39	1.02	0.4273
Error	176	936.16	5.32		

failure attributions in the relative importance they place on the five types of attributions. Further, children tended to underestimate the emphasis mothers would place on effort for mathematics failure and overestimate the emphasis their mothers would place on the luck attribution.

Table 4-27 Ratings
Predicted Failure Means as a Function of Respondent x Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	2.9	3.9	2.7	3.3	2.8
Mother	2.8	6.3	3.3	3.1	1.4

Mothers' and Children's Success and Failure Attributions for Mathematics Performance: Chip Distribution Method

Mothers and children were asked to evaluate on a six-point scale the mathematics grade from the children's most recent report card. The six point scale ranged from 1 (not doing as well as most) to 6 (doing the very best in the class). Mothers were then asked by the interviewer "Why is your child doing this well?", and children were asked "Why are you doing this well?" Mothers and children distributed 10 plastic chips on five cards labeled with five attributions to determine the relative importance of each attribution. The five attributions were ability, effort, training at school, training at home, and luck. This procedure resulted in five attribution variables, each with possible ranges of 0 to 10

for both the success and failure conditions. For example, if all ten chips are placed on one attribution there will be no chips left to place on any of the other attributions. Relative success in this study is actually mothers' and children's evaluation of the children's current level of performance. For relative failure, mothers and children were asked by the interviewer, "Why did your child not do even better?" (for mothers), and "Why aren't you doing even better?" (for the children). This condition examines relative failure as a judgment in contrast to the current level of performance.

It was hypothesized that low SES African American mothers will not agree with their children about the causes of their children's success and failure in mathematics.

For the success condition means and standard deviations for each of the attributional items are presented in Table 4-28. The results of an ANOVA of mothers' and children's mathematics success attribution means are presented in Table 4-29. The chip distribution method has no between subject effects because there were only 10 chips available for distribution. Therefore, only within subject effects will be reported in this section. The results in Table 4-29 include a significant main effect of attribution and a significant Respondent x Type of Attribution interaction indicating some discrepancies between mothers and children about the relative importance they place on the five types of attributions for success in mathematics.

Mean attributions as a function of respondent and type of attribution are reported in Table 4-30. These means show the nature of disagreement between mothers and children about the relative importance of the five types of attributions. Mothers and children differed slightly about the relative importance of the five types of attributions as

causes of mathematics success. On average, mothers weighted effort as most important, followed by school and home training which were weighted equally, followed by ability, then luck. Children on average, weighted effort as most important, followed by school training, home training, luck and ability. Mothers and children also differed in the emphasis they placed on the five types of attributions. Mothers placed more weight than the children on the effort attribution, while children placed more emphasis on the luck attribution for mathematics success. Also, children believed that school training was more important for mathematics success than their mothers. Mothers and children were similar in their weightings of ability and home training as causes of mathematics success. Overall, mothers and children agreed that effort was most important for mathematics success. However, mothers and children differed in the emphasis placed on effort. Also mothers and children differed in their beliefs about the importance of school training and luck as causes of mathematics success.

Pearson-product moment correlation coefficients presented in Table 4-31 indicate that mothers and children within the family do not agree about the causes of mathematics success. Mothers and children were also not in agreement about the children's performance in mathematics. Of the six correlations, only one coefficient was significant: ability $r = .50$, indicating a moderate relationship. However, there was very little agreement for the remaining attributions.

Table 4-28 Weightings
Mother's and Children's Mathematics Success Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	1.0	3.3	2.5	1.8	1.5
			SD	0.8	1.0	0.6	1.3	1.3
		Mother	M	0.5	5.3	1.5	2.8	0.0
			SD	1.0	2.2	1.7	1.5	0.0
	Male	Child	M	1.0	3.3	2.8	1.2	1.7
			SD	1.7	1.5	0.8	1.2	1.5
		Mother	M	1.7	5.2	1.5	1.2	0.5
			SD	3.1	2.9	1.4	1.5	1.2
7	Female	Child	M	0.8	4.0	3.0	1.0	1.2
			SD	1.1	1.3	1.5	1.7	1.6
		Mother	M	0.7	5.0	2.2	1.8	0.3
			SD	1.2	2.4	1.6	1.5	0.8
	Male	Child	M	1.2	4.2	1.8	2.0	0.9
			SD	2.0	2.4	1.7	1.9	1.1
		Mother	M	1.8	3.7	2.2	2.1	0.3
			SD	3.1	2.7	1.6	2.1	0.8
8	Female	Child	M	0.5	4.8	2.3	1.5	1.0
			SD	1.0	1.3	1.7	1.7	2.0
		Mother	M	0.8	8.0	0.8	0.5	0.0
			SD	1.5	2.4	1.5	1.0	0.0
	Male	Child	M	1.2	3.9	2.9	1.3	0.7
			SD	1.3	2.3	1.5	1.3	1.1
		Mother	M	1.4	3.2	2.6	2.6	0.1
			SD	1.7	1.7	1.4	1.7	0.4

Table 4-29 Weightings
Summary of ANOVA for Success Attributions

Source	df	SS	MS	F	p
Within					
Attribution (A)	4	697.97	174.49	40.74	0.0001
A x G	8	14.34	1.79	0.42	0.9089
A x S	4	35.30	8.82	2.06	0.0880
A x G x S	8	54.41	6.80	1.59	0.1313
Error	176	753.85	4.28		
R x A	4	57.77	14.44	5.17	0.0006
R x A x G	8	16.01	2.00	0.72	0.6768
R x A x S	4	22.23	5.56	1.99	0.0980
R x A x G x S	8	25.16	3.14	1.13	0.3480
Error	176	491.61	2.80		

Table 4-30 Weightings

Success Means as a Function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	0.9	3.9	2.5	1.4	1.2
Mother	1.1	5.0	1.8	1.8	0.2

Table 4-31 Weightings

Pearson Correlation Coefficients Between Mothers' and Children's Success Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.50*	.19	.05	.12	.10	.18

* = $p<.05$

For the failure condition, means and standard deviations for each of the attributional items are presented in Table 4-32. The results of an ANOVA of mothers' and children's attribution means are presented in Table 4-33. The results in Table 4-33 include a significant Respondent x Type of Attribution x Grade interaction and a main effect for attribution, indicating disagreement between mothers and children in each grade level about the relative importance of the five types of attributions as causes of mathematics failure. Means as a function of respondent, type of attribution, and grade are reported in Table 4-34. These means describe the nature of the disagreement between mothers and children in each grade level. On average, sixth grade children believed the home was the most important cause of mathematics failure, while seventh and eighth grade children believed effort was the most important cause. Sixth, seventh, and eighth grade mothers, on average, all agreed that effort was the most important cause of their children's mathematics failure. However, these mothers disagreed about the importance of the remaining types of attributions. Eighth grade mothers and children were more in agreement about the causes of mathematics failure than were sixth and seventh grade mothers and children. Sixth and seventh grade mothers tended to weight home training

Table 4-32 Weightings
Mother's and Children's Mathematics Failure Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	1.8	2.3	2.5	2.5	1.0
			SD	1.3	2.6	1.0	0.6	1.2
		Mother	M	1.3	5.0	2.8	0.0	1.0
			SD	1.3	0.8	2.1	0.0	1.4
	Male	Child	M	2.2	1.7	1.7	1.8	2.7
			SD	4.0	2.3	2.0	2.5	2.5
		Mother	M	1.0	4.3	1.7	1.3	1.7
			SD	1.7	4.6	4.1	2.8	2.6
7	Female	Child	M	1.7	2.8	1.1	3.0	1.4
			SD	1.6	3.3	1.4	4.0	2.0
		Mother	M	3.1	3.3	1.8	1.1	0.7
			SD	2.8	3.2	1.8	1.4	1.3
	Male	Child	M	1.5	4.0	2.0	1.3	1.2
			SD	3.0	3.8	2.1	2.0	1.9
		Mother	M	0.9	6.0	1.5	1.2	0.4
			SD	1.7	3.0	1.9	1.9	1.4
8	Female	Child	M	1.5	5.0	2.5	0.0	1.0
			SD	3.0	5.8	5.0	0.0	2.0
		Mother	M	1.8	0.3	3.5	2.0	2.5
			SD	1.7	0.5	3.9	1.8	2.5
	Male	Child	M	0.6	4.7	1.2	1.9	1.6
			SD	1.0	3.0	1.7	1.9	2.8
		Mother	M	1.3	5.6	1.5	1.4	0.2
			SD	1.8	3.1	1.5	1.6	0.6

Table 4-33 Weightings

Summary of ANOVA for Failure Attributions

Source	df	SS	MS	F	p
Within					
Attribution (A)	4	318.53	79.63	9.01	0.0001
A x G	8	26.76	3.34	0.38	0.9310
A x S	4	50.99	12.75	1.44	0.2219
A x G x S	8	73.16	9.15	1.04	0.4115
Error	176	1555.04	8.84		
R x A	4	20.53	5.13	0.93	0.4502
R x A x G	8	92.03	11.50	2.08	0.0405
R x A x S	4	41.73	10.43	1.88	0.1156
R x A x G x S	8	61.50	7.69	1.39	0.2050
Error	176	975.61	5.54		

as the least important cause while eighth grade mothers believed home training was an important cause of their children's mathematics failure. Eighth grade children believed home training was the least important cause of mathematics failure but sixth grade children believed home training was the most important cause. The most striking difference between mothers' and children's mathematics failure attributions is the emphasis on effort. The children's emphasis on effort increases from sixth to eighth grade while their mothers' emphasis decreases between the sixth and eighth grade.

In summary, mothers and children at all grade levels agreed that effort was the most important cause of mathematics failure except for sixth grade children. However,

Table 4-34 Weightings

Failure Means as a Function of Respondent, Type of Attribution, and Grade

Grade	Respondent	Ability	Effort	School	Home	Luck
6	Child	1.9	1.9	2.1	2.2	1.8
	Mother	1.1	4.7	2.2	0.7	1.3
7	Child	1.6	3.4	1.6	2.2	1.3
	Mother	2.1	4.7	1.7	1.1	0.6
8	Child	1.1	4.9	1.9	0.9	1.3
	Mother	1.5	2.9	2.5	1.7	1.4

mothers' endorsement of effort decreased as their children progressed through the middle grades while their children's endorsement of effort increased.

Pearson-product moment correlation coefficients presented in Table 4-35 indicate that mothers and children within the same family do not agree about the causes of mathematics failure and were also not in agreement about the evaluation of the children's mathematics performance. Of the six correlations, only one correlation was significant: effort, r = .32, which is a relatively small relationship.

Table 4-35 Weightings

Pearson Correlation Coefficients Between Mothers' and Children's Failure Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.19	.32*	.25	.13	-.06	.18

* = $p<.05$

Mother's Predictions of Their Children's Mathematics Success and Failure Attributions: Chip Distribution Method

Mothers were asked to predict the attributions their children would choose for mathematics success and failure. Mothers predicted on a 6-point scale how their children would evaluate the mathematics grade on their most recent report card. For predicted success, the interviewer asked mothers "Why do you think your child thinks he or she is doing this well?" For predicted failure, the interviewer asked "Why do you think your child thinks he or she is not doing even better?" Mothers predicted by distributing 10 plastics chips on five cards labeled with five attributions to determine the relative importance of each attribution. The five attributions were ability, effort, training at school, training at home, and luck. This procedure resulted in five attribution variables, each with possible ranges of 0 to 10 for both success and failure conditions.

It was hypothesized that African American mothers will not accurately predict their children's mathematics success and failure attributions. For the predicted success condition, Pearson-product moment correlation coefficients between children's actual mathematics success attributions and mothers' predictions of their children's mathematics success attributions within the family are presented in Table 4-36. The results in Table 4-36 indicate that mothers cannot accurately predict their children's mathematics success attributions within the family. Mothers were also unable to accurately predict how their children would evaluate their mathematics performance. Of the six correlations, none of them were significant.

Table 4-36 Weightings
Pearson Correlation Coefficients Between Children's Actual Success and Mothers' Predicted Success Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.33	.19	-.04	.02	-.10	.10

* = $p<.05$

Means and standard deviations for children's actual mathematics success attributions and mothers' predicted success attributions are presented in Table 4-37. The results of an ANOVA of children's actual mathematics success attributions and mothers' predicted success attributions are reported in Table 4-38.

The results in Table 4-38 include a significant Respondent x Type of Attribution interaction and a significant main effect of attribution suggesting disagreement about the relative importance the children place on the five types of attributions and the mothers' predictions about their children's attributions. Mean attributions as a function of respondent and type of attribution are reported in Table 4-39. These means show the nature of the disagreement between mothers' predicted success attributions and children's actual success attributions when weighting the importance of the five types of attributions. On average, mothers' predictions that children will place the most emphasis on effort and school is correct but mothers overestimate the amount of emphasis their children will place on effort.

On average, mothers predicted their children would weight effort as most important followed by school, ability, home, and luck. Children's actual success

attributions on average were effort as most important, followed by school, home, luck, then ability.

Although mothers predicted correctly on the importance their children would give effort and school training, mothers did not predict accurately on the emphasis their children would place on these two attributions. Mothers underestimated the emphasis their children placed on school training and overestimated how their children would weight effort. Overall, mothers were not very accurate in predicting their children's success attributions.

For the predicted failure condition, Pearson-product moment correlation coefficients between children's actual mathematics failure attributions and mothers' predictions of their children's mathematics failure attributions within the family are presented in Table 4-40. The results in Table 4-40 show that mothers cannot accurately predict how their children would evlauate their mathematics performance nor could they predict their children's mathematics failure attributions within the family. Of the six correlations, only two correlations were significant: effort, $r = .52$, indicating a moderate relationship, and home training, $r = .38$, indicating a small relationship.

Means and standard deviations of children's actual failure attributions and mothers' predictions are presented in Table 4-41. The results of an ANOVA of children's actual mathematics failure attributions and mother's predictions of their children's mathematics failure attributions presented in Table 4-42 indicate no significant interactions.

Table 4-37 Weightings
Children's Mathematics Success Attributions and Mother's Predictions of Their Children's Mathematics Success Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	1.0	3.3	2.5	1.8	1.5
			SD	0.8	1.0	0.6	1.3	1.3
		Mother	M	0.8	6.3	1.8	1.3	0.0
			SD	1.5	2.9	1.3	1.9	0.0
	Male	Child	M	1.0	3.3	2.8	1.2	1.7
			SD	1.7	1.5	0.8	1.2	1.5
		Mother	M	1.7	4.3	2.3	0.8	.83
			SD	4.1	3.3	2.1	1.6	1.3
7	Female	Child	M	0.8	4.0	3.0	1.0	1.2
			SD	1.1	1.3	1.5	1.7	1.6
		Mother	M	0.9	4.8	3.4	0.7	.20
			SD	1.5	2.1	2.5	1.2	.63
	Male	Child	M	1.2	4.2	1.8	2.0	.92
			SD	2.0	2.4	1.7	1.9	1.1
		Mother	M	1.4	4.5	2.1	1.3	.67
			SD	2.1	3.0	1.6	2.3	1.2
8	Female	Child	M	0.5	4.8	2.3	1.5	1.0
			SD	1.0	1.3	1.7	1.7	2.0
		Mother	M	2.5	6.3	0.5	0.5	.25
			SD	5.0	4.8	1.0	1.0	.50
	Male	Child	M	1.2	3.9	2.9	1.3	.71
			SD	1.3	2.3	1.5	1.3	1.1
		Mother	M	1.6	3.7	2.1	1.8	.86
			SD	1.7	1.9	1.6	1.6	1.6

Table 4-38 Weightings

Summary of ANOVA for Children's Mathematics Success Attributions and Mother's Predictions of their Children's Mathematics Success Attributions

Source	df	SS	MS	F	p
Within					
Attribution (A)	4	672.50	168.13	35.64	0.0001
A x G	8	11.85	1.48	0.31	0.9600
A x S	4	19.70	4.93	1.04	0.3859
A x G x S	8	43.55	5.44	1.15	0.3298
Error	176	830.15	4.72		
R x A	4	45.11	11.28	3.00	0.0198
R x A x G	8	25.26	3.16	0.84	0.5677
R x A x S	4	14.19	3.55	0.94	0.4393
R x A x G x S	8	12.27	1.53	0.41	0.9147
Error	176	660.82	3.75		

Table 4-39 Weightings

Predicted Success Means as a Function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	0.9	3.9	2.5	1.4	1.2
Mother	1.4	5.0	2.0	1.0	0.5

Table 4-40 Weightings

Pearson Correlation Coefficients Between Children's Actual Failure and Mothers' Predicted Failure Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.13	.52*	.05	.38*	.19	.10

* = $p<.05$

Children's Predictions of Their Mother's Mathematics Success and Failure Attributions: Chip Distribution Method

Children were asked to predict the attributions their mothers would choose for the children's mathematics success and failure. Children predicted on a 6-point scale how their mothers would evaluate the mathematics grade on their most recent report card. For predicted success, the interviewer asked children, "Why do you think your mother thinks you are doing this well?" For predicted failure, the interviewer asked "Why do you think your mother thinks you are not doing even better?" Children predicted by distributing 10 plastic chips on five cards labeled with five attributions to determine the relative importance of each attribution. The five attributions were ability, effort, training at school, training at home, and luck. This procedure resulted in five attribution variables, each with possible ranges of 0 to 10 for both success and failure conditions.

It was hypothesized that African American children will not accurately predict their mothers mathematics success and failure attributions. For the predicted success

Table 4-41 Weightings
Children's Mathematics Failure Attributions and Mother's Predictions of Their Children's Mathematics Failure Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	1.8	2.3	2.5	2.5	1.0
			SD	1.3	2.6	1.0	0.6	1.2
		Mother	M	1.8	3.5	2.3	1.8	0.8
			SD	1.7	2.6	2.2	2.4	1.5
	Male	Child	M	2.2	1.7	1.7	1.8	2.7
			SD	4.0	2.3	2.0	2.5	2.5
		Mother	M	1.5	2.7	2.3	2.0	1.5
			SD	1.6	2.2	3.9	2.3	1.8
7	Female	Child	M	1.7	2.8	1.1	3.0	1.4
			SD	1.6	3.3	1.4	4.0	2.0
		Mother	M	2.6	2.1	1.5	2.3	1.5
			SD	2.8	2.6	1.8	2.7	1.6
	Male	Child	M	1.5	4.0	2.0	1.3	1.2
			SD	3.0	3.8	2.1	2.0	1.9
		Mother	M	0.9	3.6	3.3	1.6	0.7
			SD	1.4	2.6	3.0	1.8	1.4
8	Female	Child	M	1.5	5.0	2.5	0.0	1.0
			SD	3.0	5.8	5.0	0.0	2.0
		Mother	M	1.8	5.5	0.3	1.0	1.5
			SD	2.4	5.3	0.5	1.2	1.7
	Male	Child	M	0.6	4.7	1.2	1.9	1.6
			SD	1.0	3.0	1.7	1.9	2.8
		Mother	M	1.6	4.2	1.8	1.8	0.6
			SD	2.4	2.7	2.0	1.6	1.2

Table 4-42 Weightings

Summary of ANOVA for Children's Mathematics Failure Attributions and Mother's Predictions of Their Children's Mathematics Failure Attributions

Source	df	SS	MS	F	p
Within					
Attribution (A)	4	234.80	58.70	6.29	0.0001
A x G	8	94.88	11.86	1.27	0.2612
A x S	4	7.01	1.75	0.19	0.9445
A x G x S	8	74.64	9.33	1.00	0.4377
Error	176	1641.81	9.33		
R x A	4	4.14	1.03	0.19	0.9415
R x A x G	8	26.10	3.26	0.61	0.7681
R x A x S	4	18.27	4.57	0.86	0.4921
R x A x G x S	8	16.13	2.02	0.38	0.9315
Error	176	940.21	5.34		

condition, Pearson-product moment correlation coefficients between mother's actual success attributions and children's predictions of their mothers' mathematics success attributions within the family are presented in Table 4-43. The results in Table 4-43 indicate that children cannot accurately predict their mothers' mathematics success attributions within the family nor could the children predict how their mothers would evaluate their mathematics performance. Of the six correlations, none of them were significant.

Table 4-43 Weightings
Pearson Correlation Coefficients Between Mother's Actual Success and Children's Predicted Success Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.09	.12	.12	.02	-.03	.23

* = $p<.05$

Means and standard deviations for mothers actual mathematics success attributions and children's predictions of their mother's mathematics success attributions are presented in Table 4-44. The results of an ANOVA of mothers' actual mathematics success attributions and children's predicted success attributions are reported in Table 4-45.

The results in Table 4-45 include a significant Respondent x Type of Attribution interaction and a significant main effect of attribution indicating disagreement about the relative importance the mothers place on the five types of attributions and children's predictions about their mothers' attributions. There are two types of effects in Table 4-45, effects involving respondent and effects not involving respondent. Only the effects involving respondent will be reported in this section.

Mean attributions as a function of respondent and type of attribution are presented in Table 4-46. These means show the nature of the disagreement between mothers' actual success attributions and children's predicted success attributions when weighting the importance of the five types of attributions. Children on average predicted correctly on the importance their mothers would place on the five types of attributions for predicted

Table 4-44 Weightings
Mother's Mathematics Success Attributions and Children's Predictions of Their Mother's Mathematics Success Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	1.5	3.5	2.8	1.0	1.3
			SD	1.0	1.3	0.5	1.2	1.0
		Mother	M	0.5	5.3	1.5	2.8	0.0
			SD	1.0	2.2	1.7	1.5	0.0
	Male	Child	M	2.3	3.7	2.0	1.8	0.2
			SD	1.5	1.2	1.7	1.0	0.4
		Mother	M	1.7	5.2	1.5	1.2	0.5
			SD	3.1	2.9	1.4	1.5	1.2
7	Female	Child	M	0.9	3.9	3.6	1.2	0.4
			SD	1.3	1.4	1.7	1.8	1.0
		Mother	M	0.7	5.0	2.2	1.8	0.3
			SD	1.2	2.4	1.6	1.5	0.7
	Male	Child	M	0.9	4.3	2.8	1.8	0.1
			SD	2.1	2.1	2.1	1.7	0.3
		Mother	M	1.8	3.7	2.2	2.1	0.3
			SD	3.1	2.7	1.6	2.1	0.8
8	Female	Child	M	0.3	5.5	3.3	1.0	0.0
			SD	0.5	1.3	1.3	2.0	0.0
		Mother	M	0.8	8.0	0.8	0.5	0.0
			SD	1.5	2.4	1.5	1.0	0.0
	Male	Child	M	1.8	3.2	2.8	1.5	0.6
			SD	1.3	1.3	1.3	0.9	1.1
		Mother	M	1.4	3.2	2.6	2.6	0.1
			SD	1.7	1.7	1.4	1.7	0.4

Table 4-45 Weightings
Summary of ANOVA for Mother's Mathematics Success Attributions and Children's Predictions of Their Mother's Mathematics Success Attributions

Source	df	SS	MS	F	p
Within					
Attribution (A)	4	792.27	198.07	58.63	0.0001
A x G	8	22.76	2.85	0.84	0.5666
A x S	4	53.20	13.30	3.94	0.0044
A x G x S	8	63.60	7.95	2.35	0.0199
Error	176	594.53	3.38		
R x A	4	48.79	12.20	3.88	0.0048
R x A x G	8	14.59	1.82	0.58	0.7933
R x A x S	4	20.72	5.18	1.65	0.1643
R x A x G x S	8	23.90	2.99	0.95	0.4766
Error	176	553.15	3.14		

mathematics success. On average, mothers' actual mathematics success attributions for their children's mathematics performance were effort, weighted most important, followed by school and home training which were weighted equally, then ability, and luck. Children predicted on average, effort as most important, followed by school, home, ability, the luck. However, children's predictions were not very accurate when weighting the emphasis their mothers would place on effort and school training. Children underestimated the emphasis their mothers would place on the effort attribution and overestimated the emphasis their mother's would place on school training. Children on average were very accurate in predicting the importance and emphasis their mothers

would place on the ability attribution. Children also came very close to predicting the emphasis their mothers would place on home training and luck for their children's mathematics success.

Table 4-46 Weightings

Predicted Success Means as a function of Respondent and Type of Attribution

Respondent	Ability	Effort	School	Home	Luck
Child	1.1	4.0	2.4	1.4	0.4
Mother	1.1	5.0	1.8	1.8	0.2

For the predicted failure condition, Pearson-product moment correlation coefficients between mothers' actual mathematics failure attributions and children's predictions of their mother's failure attributions within the family are presented in Table 4-47. Children were not very accurate in predicting the attributions their mothers would give for the children's mathematics failure, nor were they able to predict how their

Table 4-47 Weightings

Pearson Correlation Coefficients Between Mother's Actual Failure and Children's Predicted Failure Attributions Within the Family

Ability	Effort	School	Home	Luck	Evaluation
.24	.23	-.05	.00	-.06	.18

* = $p<.05$

mothers would evaluate their mathematics performance. Of the six correlations, none of them were significant.

Means and standard deviations of mothers' actual failure attributions and children's mathematics failure predictions are presented in Table 4-48. The results of an ANOVA of mothers actual mathematics failure attributions and children's mathematics failure predictions are presented in Table 4-49. Again, only the effect involving respondent are meaningful. The results in Table 4-49 include a significant Respondent x Type of Attribution x Grade x Sex interaction indicating disagreement between mothers and children of both sexes in each grade level about the relative importance of the five types of attributions.

Mean attributions as a function of Respondent x Type of Attribution x Grade x Sex are reported in Table 4-50. These means show the nature of the disagreement between mothers' actual mathematics failure attributions and children's predicted mathematics failure attributions.

In Table 4-50 the most striking results are for the effort attribution. In the sixth and seventh grade, females on average, are accurate predictors of their mothers' effort attributions. Eighth grade females substantially overestimate their mothers' effort attributions. Boys, on the other hand, underestimate their mothers' effort attributions in all three grades, but less so in eighth grade than in either grades six or seven.

Table 4-48 Weightings
Mother's Mathematics Failure Attributions and Children's Predictions of Their Mother's Mathematics Failure Attributions by Grade and Sex

Grade	Sex	Subject	Statistic	Ability	Effort	School	Home	Luck
6	Female	Child	M	1.0	4.8	1.0	2.0	1.3
			SD	0.8	3.5	1.4	1.8	1.0
		Mother	M	1.2	5.0	2.8	0.0	1.0
			SD	1.0	0.8	2.1	0.0	1.4
	Male	Child	M	2.2	2.2	2.8	1.3	1.5
			SD	3.9	2.1	1.7	1.5	2.3
		Mother	M	1.0	4.3	1.7	1.3	1.7
			SD	1.7	4.6	4.1	2.8	2.6
7	Female	Child	M	1.5	3.0	1.6	3.3	0.6
			SD	1.8	3.1	1.6	3.0	1.0
		Mother	M	3.1	3.3	1.8	1.1	0.7
			SD	2.8	3.2	1.8	1.4	1.3
	Male	Child	M	1.8	4.3	1.8	0.8	1.3
			SD	2.3	3.5	2.2	1.4	1.7
		Mother	M	0.9	6.0	1.5	1.2	0.4
			SD	1.7	3.0	1.9	1.9	1.4
8	Female	Child	M	1.3	7.5	1.0	0.3	0.0
			SD	2.5	2.9	2.0	0.5	0.0
		Mother	M	1.8	0.3	3.5	2.0	2.5
			SD	1.7	0.5	3.9	1.8	2.5
	Male	Child	M	1.3	5.0	1.4	1.4	1.0
			SD	1.7	3.1	1.9	1.7	1.4
		Mother	M	1.3	5.6	1.5	1.4	0.2
			SD	1.8	3.1	1.5	1.6	0.6

Table 4-49 Weightings

Summary of ANOVA for Mother's Mathematics Failure Attributions and Children's Predictions of Their Mother's Mathematics Failure Attributions

Source	df	SS	MS	F	p
Within					
Attribution (A)	4	533.75	133.44	18.41	0.0001
A x G	8	18.66	2.33	0.32	0.9570
A x S	4	9.93	2.48	0.34	0.8491
A x G x S	8	73.20	9.15	1.26	0.2662
Error	176	1275.90	7.25		
R x A	4	10.80	2.70	0.55	0.6961
R x A x G	8	115.11	14.39	2.95	0.0040
R x A x S	4	108.87	27.22	5.59	0.0003
R x A x G x S	8	85.65	10.71	2.20	0.0297
Error	176	857.19	4.87		

Overall, boys and girls in each grade level were not good predictors of their mothers' attributions about the children's mathematics failure. Eighth grade boys appeared to be the exception in that they seem to understand how their mothers would explain the causes of their mathematics failure.

Table 4-50 Weightings

Predicted Failure Means as a function of Respondent, Type of Attribution, Grade, and Sex

Grade	Respondent	Sex	Ability	Effort	School	Home	Luck
6	Child	Girl	1.0	4.8	1.0	2.0	1.3
	Mother		1.2	5.0	2.8	0.0	1.0
	Child	Boy	2.2	2.2	2.8	1.3	1.5
	Mother		1.0	4.3	1.7	1.3	1.7
7	Child	Girl	1.5	3.0	1.6	3.3	0.6
	Mother		3.1	3.3	1.8	1.1	0.7
	Child	Boy	1.8	4.3	1.8	0.8	1.3
	Mother		0.9	6.0	1.5	1.2	0.4
8	Child	Girl	1.3	7.5	1.0	0.3	0.0
	Mother		1.8	0.3	3.5	2.0	2.5
	Child	Boy	1.3	5.0	1.4	1.4	1.0
	Mother		1.3	5.6	1.5	1.4	0.2

CHAPTER 5

DISCUSSION

In this study, the causal attributions given by low SES African American mothers and children about the children's mathematics performance were examined. Two methodologies, the rating scale and chip distribution methods, were used to measure mothers' and children's attributional beliefs. Discussion of this research will involve an examination of the findings from the rating scale and chip distribution measures regarding six hypotheses. This chapter will also include implications of the findings for current attribution research, theory, and practice. Finally, the discussion will conclude with limitations of the study and recommendations for future research.

Causal attributions about school performance and the similarities and differences in attributional beliefs between parents and children have been the focus of past empirical study (Cashmore & Goodnow, 1986; Hess, Chih-Mei, & McDevitt, 1987; Holloway & Hess, 1982; Holloway, Kashiwagi, Hess & Azuma, 1986; Stevenson & Lee, 1990; Yamauchi,1989). Several problems have emerged from this research. Reviews of these studies have found them inconclusive (Parsons, Adler, and Kaczala, 1982; Holloway and Hess, 1982). In addition, there is a lack of agreement in studies about mothers' perceptions related to gender-linked attributions (Bar-Tal & Guttmann, 1981; Cashmore

& Goodnow, 1986; Holloway, 1986; Holloway & Hess, 1984; Holloway, Kashiwagi, Hess & Azuma, 1986; Parsons, Adler, & Kaczala, 1982; Stevenson & Lee, 1990; Yee & Eccles, 1988). A second problem has been the variation in types of attribution measures used across studies. The chip distribution, rating scales, and rank ordering methods all have been used in attribution studies which raises issues regarding whether the methods used matched the research question (Hau & Salili, 1993), and whether various instruments produce the same results (Elig & Frieze, 1979). For example, if a researcher wants to know the most important attribution among several for a given population, a chip distribution methodology may be appropriate because it forces the participant to allocate a limited number of chips among the attributions. If four chips out of ten are placed on one attribution, only six chips are left for the remaining attributions. The rating scale could produce different results because the participant has an opportunity to rate all attributions as high or low as the individual chooses within the limits of the likert scale. Researchers have not always explained why they chose their methods, the strengths and weaknesses of those methods and how those methods relate to the purpose of their research.

An additional problem has been that attribution research examining African American parents and children has been quite limited. Some attribution research has been done with African American children comparing their attributions to Caucasian American children's attributions about academic performance (Graham, 1991; 1994). However, there has been no research that examines African American mothers' and their children's attributions for the children's school performance (Graham, 1994).

Therefore, the primary purpose of this research was to compare the causal attributions given by low SES African American mothers with their children's attributions for the children's mathematics performance. Mothers' and children's attributions were compared to investigate several issues: (a) attributional agreement between mothers and children, (b) mothers and gender-linked attributions, (c) mothers' and children's attributional predictions, and (d) attributional agreement within individual family units. A secondary purpose was to compare two methodological instruments--the rating scale instrument and the chip distribution instrument--to measure the attributions of low SES African American mothers and children concerning these issues.

The mothers and children were selected from 6 government housing projects in Alachua County, Florida. The children were in middle school grades 6, 7, or 8. The 200 participants were divided into two sample pools. Fifty mothers and fifty children were selected for the rating scale measure and 50 mothers and 50 children were chosen for the chip distribution measure. The administration of both measures were conducted in the participants homes. Attributions of mothers and children were measured separately without the other present.

Instructions to the participants were identical except for wording changes necessary for the children and mothers. Initially mothers and children were asked to evaluate on a 6-point likert-type scale the children's mathematics grade from the most recent report card. From the evaluation, the researcher asked mothers, for the success condition, why they felt their children were performing this well, and for the failure condition, why they thought their children were not doing even better. Children were

asked the same questions about their own mathematics performance. Participants using the rating scale to measure mathematics attributions were then asked to rate on a 9-point likert-type scale the importance of ability, effort, school training, home training, and luck as attributions to explain their success or failure. Participants using the chip distribution method to measure mathematics attributions were asked to weight the importance of each attribution by distributing 10 plastic chips on 5 attributional cards labeled ability, effort, school training, home training, and luck. For the prediction portion of the study, the same procedure was used.

For both attribution methods, the data analysis included a Grade (3) x Gender (2) x Respondent (2) x Type of attribution (5) with repeated measures on the last two factors. Separate analyses were conducted for mothers' and children's success and failure attributions, and their success and failure predictions. Additionally, Pearson-Product moment correlations were used to explore the relationship of mothers' and children's evaluations within individual families and of the children's mathematics grade.

Hypotheses important to understanding the application of attribution theory to the mathematics achievement of low SES African American children were investigated. Based on the parents' and children's attribution literature involving school performance, the following six hypotheses were expected to be supported by this study:

1. Low SES African American mothers will not agree with their children about causal attributions for mathematics success and failure.

2. Low SES African American mothers will not make different attributions for boys and girls about their mathematics success and failure.

3. Low SES African American mothers will not be able to accurately predict attributions their children give for the children's mathematics success and failure performances.

4. Low SES African American children will not be able to accurately predict the attributions their mother will give for the children's mathematics success and failure performances.

5. Low SES African American mothers and children, within the same family, will not be in agreement regarding the children's mathematics success and failure performances.

6. Conclusions about the attributions will not depend on the method--chip distribution instrument or rating scale instrument--used for data collection.

The first five hypotheses were tested by both the rating scale and the chip distribution methods generating two sets of data. Because the findings from the two instruments will be used to guide the discussion of the remaining five hypotheses, hypothesis six will be discussed first.

Hypothesis Six: Comparisons of the Chip Distribution and Rating Scale Methods

Success condition

Attribution measurement results from the success condition of hypothesis six held that conclusions about attributions will not depend on the method used for data collection. Support for this hypothesis was found. Mothers were asked to evaluate their children's mathematics grade from the most recent report card. For the success condition,

mothers were asked "Why do you think your child is doing this well?" Success means from the rating scale method revealed that mothers rated the attributions in the following order of importance: 1) effort, 2) training at school, 3) training at home, 4) ability, followed by 5) luck. Mothers' success means on the chip distribution method showed mothers emphasized 1) effort, 2) training at school and training at home weighted equally, followed by 4) ability, and 5) luck. Mothers' responses from both measures appear similar. Both measures show that mothers believe their children do well in mathematics because of hard work or effort, with some emphasis on school and home training.

Children were also asked to evaluate their mathematics grade from their most recent report card. They were then asked, "Why do you think you are doing this well?" Success means from the rating scale method indicated that children rated the attributions in the following order of importance: 1) effort, 2) school training, 3) home training, 4) ability, and 5) luck. Children's success means from the chip distribution method showed children emphasized 1) effort, 2) school training, 3) home training, 4) luck, then 5) ability. This indicates that both measures show children held similar attributions for mathematics success with the exception of the luck and ability attributions. The children responding on the rating scale method believed that ability was more important than luck. However, the chip distribution method showed children believed luck was more important than ability as an explanation for mathematics success.

Failure condition

For the measurement of attributions in the failure condition, after responding to the success question, the mothers were then asked, "Why is your child not doing even better?" The failure means from the rating scale showed mothers rated the attributions in the following order: 1) lack of effort, followed by 2) lack of school training, 3) lack of home training, 4) lack of ability, and 5) bad luck. The failure means from the chip distribution method showed mothers weighted the attributions differently based on the children's grade in school. Mothers of sixth grade children weighted 1) lack of effort, 2) lack of school training, 3) bad luck, 4) lack of ability, followed by 5) lack of home training. Seventh grade mothers gave the following weightings: 1) lack of effort, 2) lack of ability, 3) lack of school training, 4) lack of home training, and 5) bad luck. Eighth grade mothers weighted 1) lack of effort, 2) lack of school training, 3) lack of home training, 4) lack of ability, then 5) bad luck. This indicates that while lack of effort was the primary attribution given for mathematics failure, using either measure, the ordering of the remaining attributions differed. A grade effect was found for the chip distribution instrument but the same effect was not found with the rating scale. Although differences were found between the two measures for mathematics failure, mothers on both measures did agree that lack of effort is the most important attribution.

Using the rating scale children rated 1) lack of home training, followed closely by 2) lack of effort. 3) Lack of school training and bad luck were rated equally, and finally, 5) lack of ability. The chip distribution method, the failure means indicated a grade effect. Sixth grade children weighted 1) lack of home training, 2) lack of school training,

3) lack of effort and lack of ability were equally weighted, and then 5) bad luck. Seventh grade children weighted 1) lack of effort, 2) lack of home training, 3) lack of ability and lack of school training were equally weighted, followed by 5) bad luck. Eighth grade children weighted 1) lack of effort, 2) lack of school training, 3) bad luck, 4) lack of ability and 5) lack of home training. Therefore, both measures revealed lack of home training, and lack of effort were the dominant attributions given by children for their mathematics failure. In the failure condition greater variation was found in children's responses with the chip distribution method, however, no help at home with mathematics and not putting forth appropriate effort were the primary explanations given by children reported in both measures.

Returning to hypothesis six, one can conclude there is similarity in the information provided by the two different methods of assessing attributions. However, the two methods do not yield data that are identical. This study did not attempt to resolve whether one method of assessing attributions is superior to another. The two methods were used to assess attributions in a more robust fashion than would be possible if only one method was used.

Prior studies in the attribution literature that involved mothers and children attributional agreement for school performance have often reported inconsistent findings. Some researchers have attributed these differences in findings to the differences in methodologies used to collect the data (Elig & Frieze, 1979; Hau & Salili, 1993). For example, Holloway and Hess (1982) used a chip distribution procedure and reported little attributional agreement among mothers and children regarding school performance. In

contrast, Parsons, Adler, and Kaczala (1982) used a rating scale, reporting attributional agreement among parents and children for mathematics performance. This study examined the mathematics attributions of mothers and children for the children's mathematics performance using the rating scale and chip distribution procedures. According to findings in the attribution literature, with the rating scale this researcher should have found attributional agreement among mothers and children, while there should have been little agreement found using the chip distribution method. However, results of this study indicated that with either measure mothers and children generally agreed about the causes of mathematics success and failure.

Elig and Frieze (1979) showed that findings can differ on the same research question depending on the measurement instrument employed. Further, Hau and Salili (1993) in a review addressing this problem, concluded that researchers have continued research efforts without any concern for matching their research question to the instrument that best serves their purpose. The findings from the current study suggest that two different data collection methods do not yield different results. The findings of this study suggest that both methods are equally useful in measuring attributions of African American mothers and children.

Hypothesis One: Attributional Agreement Between Mothers and Their Children for Mathematics Performance

The first hypothesis was concerned with agreement in attributions that African American mothers and their children give for mathematics performance. It was hypothesized that there would be no agreement between mothers and children and this

was not supported. For both the chip distribution and the rating scale procedures, mothers and children agreed on attributions for successful mathematics performance. Both groups agreed that effort, school training, and home training were the three dominant causes of mathematics success. Ability and luck were not seen as important causes. However, children believed luck was more important for mathematics success than ability. When asked to give the attributions for the failure condition mothers and children generally agreed that lack of effort, lack of school training, and lack of home training were important causes of mathematics failure. Ability and luck were judged less important.

For both the success and failure condition the pattern was generally the same: 1) effort 2) school training 3) home training 4) ability and 5) luck. These results are similar to the Parsons, Adler, and Kaczala (1982) study in that attributional agreement was found between parents and children when measured with a rating scale, but differed from the results of Holloway and Hess (1982) who used a chip distribution procedure and did not find agreement. The discrepancies in the literature about parents and children's agreement were apparently not due to the methodology employed considering the findings of this study, because the results were similar for both methodologies. The results from this study suggest that Holloway and Hess (1982) should have found similar attributions reported for mothers and children.

Holloway and Hess (1982) and Parsons, Adler, & Kaczala (1982) used two different attribution measures--chip distribution and rating scale--on similar populations--white middle class students, ranging from fifth through eleventh grade, along with their

mothers. This study used both procedures on a low income, African American students in sixth through the eighth grades along with their mothers. It is not clear why Holloway and Hess (1982) did not find agreement between mothers and children when Parsons, Adler, & Kaczala (1982) and this study did find agreement.

Hypothesis Two: Mothers' Attributions and Gender Differences

The second hypothesis asserted that low SES African American mothers would not make gender differences when making causal attributions for their sons' and daughter's mathematics performance. This hypothesis was partially supported. Findings from this study revealed that results with respect to gender differences depended on the method used to collect the attributions. Using the rating scale, mothers selected different mathematics attributions based on the gender of their children for the success condition, but not for the failure condition. Mothers believed that ability was more important for boys' success than for girls success and effort was more important for girls than for boys. However, mothers did not make this distinction when it came to mathematics failure. In another study using a rating scale Yee and Eccles (1988) found that parents attributions varied based on the gender of their children for successful mathematics performance but not for the failure condition. In contrast to these findings, when the chip distribution method was used mothers did not select different attributions in either the success or failure condition for their sons and daughters. Therefore, the chip distribution method found that mothers believe boys and girls succeed and fail in mathematics for the same reasons. Other studies have also found that attributions used by mothers are similar for

sons and daughters. Holloway, Kashiwagi, Hess, and Azuma (1986) who used a chip distribution procedure and reported that Japanese mothers did not discriminate in their mathematics attributions for their sons and daughters.

The studies in the attribution literature examining gender issues have investigated a variety of cultural groups and used several measurement procedures (Cashmore & Goodnow, 1986; Holloway, Kashiwagi, Hess, & Azuma, 1986; Parsons, Adler, & Kaczala, 1982). Their findings have not been consistent. In this study, two measurement procedures were used to measure African American mothers' mathematics attributions and gender differences, and the findings were also inconsistent. Therefore, this study did not clarify mothers' gender-related attributions for mathematics.

Hypotheses Three and Four: Mothers' Attributional Predictions and Children's Attributional Predictions for Mathematics Performance

The third and fourth hypotheses asserted that mothers would not be able to accurately predict the attributions their children would give, and children would not be able to predict the attributions their mothers would give for the children's mathematics performance. These hypotheses were both generally supported using both the rating scale and chip distribution methodologies. Generally mothers and children could predict the order of importance of the attributions that the other would give, however, the prediction of the emphasis placed on each attribution was not accurate. The finding that children could not predict the attributions their mothers would give is similar to Yamauchi's (1989) study which used a rating scale in which Japanese children could not predict

accurately the attributions their mothers would give for the children's mathematics performance. Unlike Yamauchi (1989), the present study examined whether mothers could predict their children's mathematics attributions. Means from both the rating scale and chip distribution procedures found that mothers were not accurate predictors of the emphasis their children would place on the mathematics attributions.

Hypothesis Five: Attributional Agreement Within Families for Mathematics Performance

The fifth hypothesis asserted that mothers and children within the same household would not agree about the causes of mathematics performance. Unlike the previous analysis of groups, this study examined the relationship between mothers and children within a home. The results from this study supported this hypothesis. Using either a rating scale or chip distribution procedure, correlations revealed that mothers and children living in the same household were not in agreement about the causes of mathematics success and failure. The majority of the correlation coefficients in the success and failure conditions were not significant, indicating little agreement on the five attributions. Those correlation coefficients in both the success and failure conditions that were significant tended to be small.

Support for these results were found in prior research by Holloway, Kashiwagi, Hess, and Azuma (1986) who compared the attributions of Japanese mothers and children to the attributions of American mothers and children for mathematics performance using a chip distribution procedure. One major issue in their study concerned attributional agreement among mothers and children living in the same household. It was believed

that mothers and children may hold similar attributions when explaining the children's mathematics performance, suggesting attributional beliefs are passed directly from parents to children. Their results indicated that mothers and children in the same household did not hold similar attributions in either culture when explaining mathematics performance. This suggests that attributional beliefs are developed from a variety of sources such as teachers, peers, and the media (Holloway, Kashiwagi, Hess & Azuma, 1986). This appears to be the case with African American mothers and children.

One finding for which there was no hypothesis related to the evaluation of the children' mathematics performance. Mothers and children were asked to evaluate the children's mathematics grade from the most recent report card. Means from the rating scale and chip distribution methods showed that mothers and children were not in agreement about how well the children were performing in mathematics. Children believed they were performing better in mathematics than their mothers did. This finding may be important as low SES African American students historically have not achieved as well in mathematics when compared to other groups (Reyes & Stanic, 1988).

In summary, although studies on African American mothers' and children' attributions for school performance were not found in the attribution literature (Graham, 1994), this study found that African American mothers and children were generally in agreement about the causes of mathematics success and failure. Means showed mothers and children used three dominant attributions to explain mathematics performance: effort, school training, and home training. Correlations showed little attributional agreement between mothers and children within the same household. Means also

indicated children were not accurate predictors of the attributions their mothers would give for the children's mathematics performance, and mothers were not accurate predictors of the attributions their children would give. Mothers and children did not even agree on how well the children were actually performing in mathematics. These findings were consistent using either a rating scale or a chip distribution methodology. No other study has looked at all the issues that this study has examined. The only study that is similar in some respects is Holloway, Kashiwagi, Hess, & Azuma (1986) which explored parent-child agreement, gender and mothers' attributions, and parent-child agreement within the family.

Discussion

Studies investigating various cultures have reported inconsistent findings about parents' and children's attributions for academic performance, and have generally been inconsistent in the methods chosen to measure attributions of parents and children. Studies that compared Asian mothers and children (Chinese, Japanese, Taiwanese) generally found that mothers and children agreed that the effort attribution was the primary cause of mathematics performance (Hess, Chih-Mei, and McDevitt, 1987; Stevenson & Lee, 1990; Yamauchi, 1989). In studies with Australian and Caucasian American parents and children, the results generally showed that parents and children gave different attributions for academic performance (Cashmore, 1980; Cashmore & Goodnow, 1986; Holloway & Hess, 1982). For example, Cashmore and Goodnow (1986) found that parents stressed talent (ability) for school success, while children

stressed effort. For failure, parents cited lack of effort, while children cited lack of talent and of effort.

This study indicates that on average low SES African American mothers and children give similar attributions for mathematics success. This population attributes mathematics success primarily as a consequence of effort, with emphasis placed on school and home training. For mathematics failure, mothers and children gave the same order of importance for the attributions that they had given for success condition, however mothers placed significant emphasis on lack of effort and little emphasis on the remaining attributions. Their children, on the other hand, did not explain mathematics failure with any one attribution but saw all five attributions as contributing equally. The ratings and weightings, for failure attributions, tended to have similar means. This indicates, that for failure, no one attribution received more emphasis than another. Therefore, children did not see any of the five attributions contributing significantly to their mathematics failure. This may be an area of concern because low SES African American children tend not to achieve as well in mathematics as other groups and for the children not to have an explanation for poor performance may be problematic.

This study is a beginning of exploratory research to examine motivational patterns in the low SES African American family. Graham (1994) stated that there were no studies examining the attributions of the African American family. Below are several implications for this study.

Empirical Implications

One empirical implication from this study involves the measurement of attributions. Some researchers have argued that variations in measurement techniques could result in different findings (Elig & Frieze, 1979; Hau & Salili, 1993). This study showed that two separate measurement instruments investigating the same research question yield comparable results. The findings from the chip distribution and rating scale methods used in this study imply that the differences reported in the attribution literature may not be due to the method employed to measure those attributions, but could be due to other factors such as culture, personal bias of the subjects, or the wording of the questions themselves.

Additionally, the results from this study imply that mothers do not pass on their attributions directly to their children. This finding is consistent with Holloway, Kashiwagi, Hess, & Azuma (1986) who reported that Japanese and American mothers are not the primary source of attributions their children may hold regarding mathematics performance. However, in this study, as a population, African American mothers and children were in agreement about the attributions that are important for mathematics success and failure. It is unclear why, in this study, that so much agreement was found in the larger group, but little agreement was found within individual family units.

An additional empirical implication is the question of mothers' attributions in relation to their sons' and daughters' mathematics performance. This study did not make clear if African American mothers do make different attributions for their children depending on their gender. The chip distribution instrument revealed that mothers do not discriminate between their sons and daughters. However, the rating scale showed, for

mathematics success only, that mothers believed boys had more ability in mathematics than girls, and girls needed to try harder than boys to be successful in mathematics.

Practical Implications

It has been argued by Graham (1988, 1989, 1991, 1994) that Weiner's attribution theory was a useful and appropriate framework for examining motivation patterns in African Americans. The findings of this study show that Weiner's attribution model can be used to identify and explain motivational patterns of low SES African American mothers and children. This study found that effort in Weiner's attributional model is an important attribution for African American mothers and children to explain mathematics performance.

One implication of this study for practitioners (mathematics teachers who instruct low SES African American children and have contact with their parents) is that they can use an understanding of the attribution patterns of this population to better assist the children into more successful mathematics performance. Further, they can assist the parents by providing activities and strategies that are consistent with the attribution patterns of the mothers: mothers believe for mathematics success their children must try hard. Homework and other activities should be designed where the children have to try hard to achieve success. Teachers should also realize that mothers and children also believe school training is important for mathematics success. Therefore, this population believes the teacher plays an important role in the children's mathematics success. Teachers also can play a role in assisting parents in helping their children at home.

African American children, in this study, believed training at home to be an important attribution for mathematics success and failure.

Researchers interested in retraining African American students to explain mathematics performance as a consequence of effort instead of lack of ability should be informed by this study that African American children are already using the effort attribution to explain mathematics performance, at least in this study. This population gave little importance to the ability attribution concerning mathematics success and failure.

Limitations

Several limitations were present in this study. First, the causal attributions chosen for this study were the ones present in the two instruments being compared (Holloway & Hess, 1982; Parsons, Adler & Kaczala, 1982). This confined participants to a limited set of attributions, an open-ended questionnaire may have elicited different attributions for this population (Benson, 1989; Hau & Salili, 1993). Further research should determine which attributions are spontaneously used by this population. Second, the participants were volunteers. This could mean that the people who volunteered were not representative of all low SES African American mothers and children. Finally, all material were read to the participants by the researcher, as they read along because of possible educational limitations of the participants.

Recommendations for Future Research.

There are several recommendations for future research. First this was an exploratory study in an area that has not received much research attention. Graham

(1994) pointed out the need for more research in this area. Researchers have tended to examine African American children's attributions in a racial-comparative context and did not isolate African American mothers and children for study. Therefore, replications of this study are highly recommended.

Second, this study focused on attribution elements and not the attribution process (see Graham & Long, 1986; Benson, 1989). Future studies could compare mothers and children on how they perceive attribution elements on the attributional dimensions to determine the relationship between attributions and the psychological consequences linked to those dimensions. For example, do African American mothers and children see effort as internal or external, temporary or permanent, controllable or uncontrollable attribution?

Third, in the area of attribution retraining, future studies might attempt to train students to the ability attribution (in combination with the effort attribution) and retrain students away from the use of the luck attribution. Although luck was seen by mothers and children as one of the least important attributions, children in this study placed considerable emphasis on the luck attribution compared to their mothers, whether it involved mathematics success or failure.

APPENDIX A
PARENTAL INFORMED CONSENT

PROJECT TITLE: Causal Explanations for Mathematics Performance Given by Low Socioeconomic Status African American Mothers and Their Children

PRINCIPLE INVESTIGATOR: Kenneth R. Cyrus, Ph.D. Candidate,
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Foundations of Education
Home Address: 808 N. W. 7th Ave
Gainesville, Florida 32601
Home Phone: (904) 376-6004

I agree to allow my child and myself to participate in this study as explained below:

The aim of this study is to assess the reason (causal attributions) that African American students give for their math success and failure in school. We also want to compare those reasons to the reasons mothers give for their child's math success and failure. The information collected will be used to better understand achievement motivation in African American students. The names of those who participate in the study will not be included in any report.

To participate in the study, you and your child will be asked to respond to one of two situations.

In the first type of situation, you and your child will be asked to rate your child's performance and then place ten plastic chips on five attributions which are written on five cards. This will weight how important the reasons are for your child's performance.

OR, in the second situation, you and your child will be asked to evaluate your child's math performance. Then you and your child will be asked to rate five causal attributions that explain math success and failure. Also, you and you child will be asked to predict how the other would rate the five attributions.

You will need to bring the child's most recent report card from school. The study required thirty minutes to complete and will be given in your home or other location that is convenient for you. No discomfort is anticipated in completing the questionnaires and no monetary compensation is provided. Although no immediate benefits are expected for you or your child by participating in this study, you and your child's participation will aid in the increased understating about minority motivation.

Please feel free to ask any questions you may have about this study at any time. You may drop out to the study at any time, as your participation it totally voluntary. You do not have to answer any question you do not wish to answer.

The nature and purpose of this study, as printed above has been explained to me. Any information given to the researcher will remain confidential. You and your child will be assigned a number which will appear on all study materials. Only the researcher will know what number you have been given. Your name will never be used. At the conclusion of the study, lists of participants, or anything that might identify a participant, will be destroyed.

You should keep this page for your records after signing the consent on the next page.

CONSENT FORM

STUDENT'S NAME: _____
Please print

STUDENT'S GRADE: _____

PARENT'S NAME: _____
Please print

PROJECT TITLE: Causal Explanations for Mathematics Performance Given by Low Socioeconomic Status African American Mothers and Their Children

I have read, and I understand the procedure described on the previous pages.

I agree to allow myself and my child to participate in the attribution study, and I have received a copy of the procedures involved.

_____ _____
Parent's signature Date

_____ _____
Kenneth R. Cyrus, Principle Investigator Date

APPENDIX B

STUDENT ASSENT FORM

Hello, my name is Kenneth R. Cyrus. I am a graduate student at the University of Florida. I am conducting a study about motivation of African American students in the 6th, 7th, and 8th grades. I am very interested in the reasons African American students give for success and failure in math at school. I would also like to know what your mother thinks about the reasons you give for success and failure in math.

Your mother has agreed to participate in the study. I would like to know if you would also like to participate. You don't have to be in the study if you don't want to. If you agree to participate, you can get out of the study at any time. You do not have to answer any question you do not wish to. You will be asked to place chips on cards that have reasons on them for why you succeed or fail. Or, you will be asked to fill out rating scales for the reasons you give. It will take 10 or 15 minutes to place the chips or to complete the rating scales.

Your mother and teachers will not see the rating scales or the chip placement. I will keep the information you give me confidential, which means I will have a number that will be on your materials and I will not use your name. When the study is finished, I will destroy anything that has your name on it. Your mother will not be in the room with us when participate in this study.

We will meet together in your home or at another location that is convenient for you to do this study.

You will receive no money for your participation.
Would you like to participate?

_____ YES _____ NO

_____ YOUR NAME _____ TODAY'S DATE

REFERENCES

Alexander, K., & Entwisle, D. (1988). Achievement in the first two years of school: Patterns and processes. Monographs of the Society for Research in Child Development 53, (2, Serial No. 218).

Bar-Tal, D., & Guttmann, J. (1981). A comparison of teachers', pupils', and parents' attributions regarding pupils' academic achievements. Journal of Educational Psychology, 51, 301-311.

Benson, M. J. (1989). Attributional measurement techniques: Classification and comparison of approaches for measuring causal dimensions. Journal of Social Psychology, 129, 307-323.

Bird, J. E., & Berman, L. S. (1984). Differing perceptions of mothers, fathers, and children concerning children's academic performance. Journal of Psychology, 119, 113-124.

Cashmore, J. (1980, May). Models of intelligence and development: A child's eye view. Paper presented at the Jubilee Congress of ANZAAS, Adelaide, Australia.

Cashmore, J. (1982). Parent-child agreement on attributional beliefs: Differences associated with ethnic background and gender of child. Paper presented to the second Child Development Conference, Melbourne, Australia.

Cashmore, J. A., & Goodnow, J. J. (1986). Parent-child agreement on attributional beliefs. International Journal of Behavioral Development, 9, 191-204.

Dunton, K. J., McDevitt, T. M., & Hess, R. D. (1988). Origins of mothers' attributions about their daughters' and sons' performance in mathematics in sixth grade. Merrill-Palmer Quarterly, 34, 47-70.

Eccles, J. (1985). Why doesn't Jane Run? Sex differences in educational and occupational patterns. In F. D. Horowitz & M. O'Brien (Eds.), The gifted and talented: A developmental perspective (pp 251-295). Washington, DC: American Psychological Association.

Elig, T. W., & Frieze, I. H. (1979). Measuring causal attributions for success and failure. Journal of Personality and Social Psychology, 37, 621-634.

Fox, L. H., Tobin, D., & Brody, L. (1979). Sex-role socialization and achievement in mathematics. In M. S. Wittig & A. C. Peterson (Eds.), Sex-related differences in cognitive functioning: Developmental issues (pp 303-332). New York: Academic Press.

Graham, S. (1988). Can attribution theory tell us something about motivation in blacks? Educational Psychologist, 23, 3-21.

Graham. S. (1989). Motivation in Afro-Americans. In G. Berry and J. Asamen (Eds.), Black students: Psychological issues and academic achievement (pp 40-68). Newbury Park, CA: Sage.

Graham, S. (1991). A review of attribution theory in achievement contexts. Educational Psychology Review, 3, 5-39.

Graham, S. (1994). Motivation in African Americans. Review of Educational Research, 64, 55-117.

Graham, S., & Long, A. (1986). Race, class, and the attributional process. Journal of Educational Psychology, 78, 4-13.

Hall, P. Q. (1981). Problems and solutions in education, employment and personal choices of minority women in science. Washington, DC: American Association for the Advancement of Science, Office of Opportunities in Science.

Hall, V., Howe, A., Merkel, S., & Lederman, N. (1986). Behavior, motivation, and achievement in black and white junior high school science classes. Journal of Educational Psychology, 97, 108-115.

Hau, K., & Salili, F. (1993). Measurement of achievement attribution: A review of instigation methods, question contents, and measurement formats. Educational Psychology Review, 5, 377-422.

Heider, F. (1958). The psychology of interpersonal relations. New York: Wiley.

Hess, R. D., Azuma, H., Kashiwagi, K., Dickson, W. P., Nagano, S., Holloway, S. D., Miyake, K., Price, G., Hatano, G., & McDevitt, T. (1986). Family influences on school readiness and achievement in Japan and the United States: An overview of a longitudinal study. In H. Stevenson, H. Azuma, & K. Hakuta (Eds.), Child development and education in Japan (pp. 147-185), New York: W. H. Freeman.

Hess, R. D., Chih-Mei, C., & McDevitt, T. M. (1987). Cultural variations in family beliefs about children's performance in mathematics: comparisons among People's Republic of China, Chinese-American, and Caucasian-American families. Journal of Educational Psychology, 79, 179-188.

Hess, R. D., & Holloway, S. D., & King, D. R. (1981). Causal explanations for low and high performance in school: Some contrasts between parents and children. Paper presented at the biennial meeting of the Society of Research in Child Development, Boston.

Hess, R. D., & McDevitt, T. M. (1985). Some antecedents of maternal attributions about children's performance in mathematics. In R. Ashmore & D. Brodzinsky (Eds.), Perspectives on the family (pp 95-118).Hillsdale, NJ:Erlbaum.

Hess, R. D., McDevitt, T. M., & Chen, (1988). Causal attributions by Chinese-American and Caucasian-American mothers and children about children's performances in mathematics. Unpublished paper presented at 23rd Congress of Psychology. Acapulco.

Holloway, S. D. (1986). The relationship of mothers' beliefs to children's mathematics achievement: Some effects of sex differences. Merrill-Palmer Quarterly, 32, 231-250.

Holloway, S. D. (1988). Concepts of ability and effort in Japan and the United States. Review of Educational Research, 58, 327-345.

Holloway, S. D., & Hess, R. D. (1982). Causal explanations for school performance: Contrasts between mothers and children. Journal of Applied Developmental Psychology, 3, 319-327.

Holloway, S. D., & Hess, R. D. (1984). Mothers's and teachers attributions about children's math performance, In I. E. Sigel (Ed.), Parental belief systems: The psychological consequences for children. Hillsdale, NJ: Erlbaum.

Holloway, S. D., Hess, R. D., & King, D. R. (1981). Mothers' and children's explanations for school performance: Relation to academic achievement. Paper present at the annual meeting of the American Educational Research Association, Los Angeles.

Holloway, S. D., Kashiwagi, K., Hess, R. D., & Azuma, H. (1986). Causal attributions by Japanese and American mothers and children about performance in mathematics. International Journal of Psychology, 21, 269-286.

Jenkins, L. E. (1989). The black family and academic achievement. In G. Berry and J. Asamen (Eds.), Black students: Psychological issues and academic achievement (pp 138-152). Newbury Park, CA: Sage.

Karabenick, J. D., & Heller, K. A. (1976). A developmental study of effort and ability attributions. Developmental Psychology, 12, 559-560.

Kenschaft. P. (1981). Black women in mathematics. American Mathematical Monthly, 81, 592-604.

King, D. R., Hess, R. D., & Holloway, S. D. (1981). A study of mothers' and children's performance in school subjects. Paper presented at the annual meeting of the American Educational Research Association, Los Angeles.

Kloosterman, P. (1983). Attribution theory and achievement in mathematics. Unpublished manuscript, University of Wisconsin, Madison, WI.

Malcolm, S. M., Hall, P. Q., & Brown, J. W. (1976). The double bind: The price of being a minority woman in science (Report No. 76-R-3). Washington, DC: American Association for the Advancement of Science.

Maruyama, G. (1982). How should attributions be measured? A reanalysis of data from Elig and Frieze. American Educational Research Journal, 19, 522-528.

Matthews, W. (1984). The third national assessment: Minorities and mathematics. Journal for Research in Mathematics Education, 15, 165-171.

Meyer, J. P. (1980). Causal attributions for success and failure; A multivariate investigation of dimensionality, formation, and consequences. Journal of Personality and Social Psychology, 38, 704-715.

Meyer, J. P., & Koebl, S. L. M. (1982). Dimensionality of students' causal attributions for test performance. Personality and Social Psychology Bulletin, 8, 31-36.

Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. Child Development, 49, 800-814.

Parsons, J. E., Adler, T. F., & Kaczala, C. K. (1982). Socialization of achievement attitudes and beliefs: Parental influences. Child Development, 53, 310-321.

Passer, M. W. (1977). Perceiving the causes of success and failure revisited: A multidimensional scaling approach. Doctoral dissertation, University of California at Los Angeles. Dissertation Abstracts International, 38, (11), 5662B.

Reyes, L. H. (1984). Affective variables and mathematics education. The Elementary School Journal, 84, 558-581.

Reyes, L. H., & Stanic, G. M. A. (1985). A review of literature on Blacks and mathematics. Information Bulletin No. 1, 2-10.

Reyes. L. H., & Stanic, G. M. A. (1988). Race, sex, socioeconomic status and mathematics. Journal for Research in Mathematics Education, 19, 26-43.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80, (1, Whole No. 609).

Stern, P. (1983). A multimethod analysis of student perceptions of causal dimensions. Doctoral dissertation, University of California at Los Angeles. Dissertation Abstracts International, 44(12), 3664A.

Stevenson, H. W. (1983). Making the grade: School achievement in Japan, Taiwan, and the United States. Stanford, CA: Center for Advanced Study in the Behavioral Sciences.

Stevenson, H. W., Chen, C., & Uttal, D. (1990). Beliefs and achievement: A study of Black, White, and Hispanic children. Child Development, 61, 508-523.

Stevenson, H. W., & Lee, S. (1990). Contexts of Achievement. Monographs of the Society for Research in Child Development (221), 55, 59-67.

Stevenson, H. W., Lee, S., & Stigler, J. W. (1986). Mathematics achievement of Chinese, Japanese, and American children. Science 231, 693-699.

Triandis, H. (1972). The analysis of subjective culture. New York: Wiley.

Weiner, B. (1979). A theory of motivation for some classroom experiences. Journal of Educational Psychology, 71, 3-25.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. Psychological Review, 92, 548-573.

Weiner, B. (1986). An attributional theory of motivation and emotion. New York: Springer-Verlag.

Weiner, B., Frieze, I., Kukla, A., Reed, L., Rest, S., & Rosenbaum, R. (1971). Perceiving the causes of success and failure. In E. E. Jones (Ed.), Attribution: Perceiving the causes of behavior. New York: General Learning Press.

Weiner, B., Nirenberg, R., & Goldstein, M. (1976). Social learning locus of control versus attributional (causal stability) interpretation of expectancy for success. Journal of Personality, 44, 52-68.

Weiner, B., Russell, D., & Lerman, D. (1979). The cognition-emotion process in achievement-related contexts. Journal of Personality and Social Psychology, 7, 1211-1220.

Whitley, B. E., & Frieze, I. H. (1985). Children's causal attributions for success and failure in achievement settings: A meta-analysis. Journal of Educational Psychology, 77, 608-616.

Wimer, S., & Kelley, H. H. (1982). An investigation of the dimensions of causal attribution. Journal of Personality and Social Psychology, 43, 1142-1162.

Yamauchi, H. (1989). Congruence of causal attributions for school performance given by children and mothers. Psychological Reports, 64, 359-363.

Yee, D. K. (1984). Parent perceptions and expectations for children's math achievement. Unpublished paper, University of Michigan.

Yee, D. K., & Eccles, J. S. (1988). Parent perceptions and attributions for children's math achievement. Sex Roles, 19, 317-333.

BIOGRAPHICAL SKETCH

Kenneth Ramon Cyrus was born May 30, 1956, in Crystal Springs, Mississippi, and grew up in Tuskegee, Alabama. Kenneth attended Chicago State University from 1974 to 1978 on a basketball scholarship. Kenneth was named N.A.I.A. All-American in basketball and received a bachelor's degree in psychology in 1978. In 1981, Kenneth received his master's degree in counseling from Tuskegee University. He worked for several years as a public school teacher in Georgia. Kenneth also worked as a counselor and placement director at Stillman College in Tuscaloosa, Alabama, for two years before pursuing his Ph.D. at the University of Florida.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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